



SIOP PIPING CLASSES

DEP 31.38.01.12-Gen.

January 1999

DESIGN AND ENGINEERING PRACTICE



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The information set forth in these publications is provided to users for their consideration and decision to implement. This is of particular importance where DEPs may not cover every requirement or diversity of condition at each locality. The system of DEPs is expected to be sufficiently flexible to allow individual operating companies to adapt the information set forth in DEPs to their own environment and requirements.

When Contractors or Manufacturers/Suppliers use DEPs they shall be solely responsible for the quality of work and the attainment of the required design and engineering standards. In particular, for those requirements not specifically covered, the Principal will expect them to follow those design and engineering practices which will achieve the same level of integrity as reflected in the DEPs. If in doubt, the Contractor or Manufacturer/Supplier shall, without detracting from his own responsibility, consult the Principal or its technical advisor.

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NOTE: In addition to DEP publications there are Standard Specifications and Draft DEPs for Development (DDD). DDDs generally introduce new procedures or techniques that will probably need updating as further experience develops during their use. The above requirements for distribution and use of DEPs are also applicable to Standard Specifications and DDDs. Standard Specifications and DDDs will gradually be replaced by DEPs.

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1. INTRODUCTION

1.1 SCOPE

This DEP contains the SIOP standard piping classes which have been developed for use in new construction and maintenance for onshore installations. The basis of design of the piping classes is given in DEP 31.38.01.10-Gen.

This is a revision of the DEP of the same number dated December 1996. A summary of the changes since the last revision is included in Section 1.5.

The general requirements for piping systems are specified in DEP 31.38.01.11-Gen.

Piping classes primarily developed for offshore SIEP facilities (platform piping) are contained in DEP 31.38.01.15-Gen.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by SIOP and SIEP, the distribution of this DEP is confined to companies forming part of or managed by the Royal Dutch/Shell Group, and to Contractors nominated by them (i.e. the distribution code is "C", as defined in DEP 00.00.05.05-Gen.).

This DEP is intended for use in oil refineries, chemical plants, gas plants and supply/marketing installations, and where applicable, onshore exploration and production facilities (all within the property limits as defined in ASME B31.3, Section 300.1).

If national and/or local regulations exist in which some of the requirements may be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable as regards safety, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned with the object of obtaining agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

1.3.1 General definitions

The **Contractor** is the party which carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Principal** is the party which initiates, and ultimately pays for, the project. The Principal will generally specify the technical requirements. The Principal may also include an agent or consultant, authorised to act for the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

1.3.2 Specific definitions

Hydrogen service is a service in which the process stream contains hydrogen at a partial pressure of 7 bar (abs) and higher.

Low temperature is a metal temperature of 0 °C and lower.

Piping class is an assembly of piping components in a piping system, suitable for a defined service within design limits.

Post Weld Heat Treatment is heat treatment carried out after welding to reduce residual stresses and to temper hardened microstructures created by welding.

1.4 REFERENCES

SHELL STANDARDS

Index to DEPs and standard specifications	DEP 00.00.05.05-Gen.
Metallic materials - prevention of brittle fracture	DEP 30.10.02.31-Gen.
Piping classes - basis of design	DEP 31.38.01.10-Gen.
Piping - general requirements	DEP 31.38.01.11-Gen.
SIEP piping classes	DEP 31.38.01.15-Gen.

AMERICAN STANDARDS

Process piping	ASME B31.3 (1997)

Issued by:
American National Standards Institute
11 West 42nd street, 13th. floor
New York, NY 10036
USA

1.5 SUMMARY OF CHANGES SINCE THE LAST REVISION

Piping class	Rev. Letter	Rev. Date	Revision notes (see end of Table)	Additional description
11023	B	1298	o1	
11025	B	1298	b2	
11031	B	1298	a2, v13, y1	
11042	A	1298	y1	
11172	B	1298	p3, y1,	
11173	A	1298	l1, p3, y2	
11261	B	1298	h2	
11372	B	1298	o1	
11373	B	1298	y1	
12040	C	1298	f3, j3, j5, p4, p5, v3, v12	
12080	C	1298	f3, j5, p3, p4, v3, v12	
13011	B	1298	g2, j1, v3, y1	
13021	B	1298	g4, v3, y1	
13031	B	1298	g2, g4, v3, y1	
13091	B	1298	g2, v3	
13100	A	1298	g2, v3, v7	
15011	A	1298	u1	
16071	B	1298	g2	
17010	O	1298		New
17061				Deleted; replaced by class 17010
17070	B	1298	g2, g11, b1, h2, v2	
17075	O	1298		New
17090				Deleted; replaced by class 17310
17101	B	1298	g2, g11, b1, h2, v1, v6	
17110				Deleted; replaced by class 17320
17120	B	1298	g2, g11, b1, h2, v1	
17160				Deleted; replaced by class 17010
17200	O	1298		New
17210	O	1298		New
17220	O	1298		New
17230	O	1298		New
17310	O	1298		New
17320	O	1298		New
18011	B	1298	g11, j4, p7	
18030				Deleted
18040	B	1298	g1, g2, g3, g9, j5, j6, h2, v5	
18070	B	1298	g2, g5, b3, j2, p6, v2, v5	
18081	B	1298	g11, p8	
18101	B	1298	g10, h3, p1	
18120	B	1298	g2, b3, c1, c2, f4, p6, v5	
18160	B	1298	g5,b3, p6, v5	
31012	A	1298	g2	
31025	A	1298	b2	
31031	B	1298	a2, v4, v9, v11, v13	
31160	O	1298		New
31172	B	1298	p3	
31173	B	1298	p3	
31176	B	1298	n1	
31261	B	1298	h1	
31310	O	1298		New
32010	B	1298	g2, c2, p3, v3	
32020	C	1298	g2, g8, f2, h2, v3, y2	
32021	B	1298	g2, g8, a2, h2, v3, v8	
32040	C	1298	g2, g8, c2, v3, y2	
32080	B	1298	g8, c2, p3, v3, y2	
32110	B	1298	g2, p3, v3, v9	
33011	B	1298	g2	
33021	B	1298	y1	

SUMMARY OF CHANGES SINCE THE LAST REVISION (continued)

Piping class	Rev. Letter	Rev. Date	Revision notes (see end of Table)	Additional description
33031	B	1298	y2	
33050	C	1298	g2, j3	
33055	B	1298	g2, j3	
36080	O	1298		New
61011	B	1298	t1, v4	
61013	B	1298	t1	
61015	B	1298	t1	
61031	A	1298	a2, t1, v4, v13	
61041	A	1298	t1	
61042	A	1298	t1	
61055	B	1298	t1	
61071	B	1298	t1	
61076	B	1298	t1	
61172	B	1298	j3, t1	
61173	B	1298	j3, t1	
61261	B	1298	t1, v10	
61371	C	1298	t1	
62010	C	1298	g2, c2, j3, t1, v3	
62020	C	1298	g2, j3, t1, v3	
62040	B	1298	g2, c2, j3, t1, v3	
62110	B	1298	g2, j3, t1, v3, v7	
62120	B	1298	g2, j3, t1, v3, v7	
63011	B	1298	g2, t1	
63021	B	1298	g2, t1	
63050	C	1298	g2, j3, t1	
63055	B	1298	g2, j3, t1, v3, v7	
63090	B	1298	g7, f1, f3, p2, p5, t1, v3, v7	
91011	B	1298	t1	
91015	B	1298	t1	
91031	A	1298	t1	
91041	A	1298	t1	
91042	A	1298	t1	
91055	B	1298	t1	
91071	B	1298	t1	
91172	B	1298	t1	
91261	B	1298	t1	
92010	C	1298	g2, g6, c2, t1, v3	
92020	C	1298	g2, g6, t1, v3	
92110	C	1298	g2, g6, t1, v3	
92120	B	1298	g2, g6, t1, v3	
93021	B	1298	g2, t1	
93050	C	1298	g2, t1	
93055	B	1298	g2, t1	
151011	A	1298	v4	
151031	A	1298	v4	
151261	B	1298	a1, v9	
152020	C	1298	g2	
153050	C	1298	g2, j3	
251011	B	1298	a2	
251031	A	1298	v9	
253055	B	1298	g2	

Revision Notes:

General	g1	Branch table deleted
	g2	P/T rating changed - revision ASME B16.5 1996
	g3	Size DN 250 and 300 deleted
	g4	Size DN 600 added
	g5	Wallthickness added
	g6	Wallthickness increased DN 100
	g7	Wallthickness reduced DN 300
	g8	Wallthickness reduced DN 50
	g9	Wallthickness reduced DN 200
	g10	Wallthickness reduced DN 200-400
	g11	Material description changed
Assemblies	a1	Vent points corrected
	a2	Valves for assemblies changed/added
Bolting	b1	Boltsets deleted
	b2	Boltsets butterfly valves changed
	b3	Boltsets spacers deleted
Components	c1	Size DN 25-DN 150 changed to PN 10
	c2	Description updated
Fittings	f1	Reducing components added
	f2	Branch outlets DN 50 added
	f3	Elbows range extended
	f4	Reducing cross deleted
Gaskets	h1	MESC no. changed DN 15-80
	h2	Type changed
	h3	Range completed
Flanges	j1	Blindflanges added
	j2	Liner blindflange added
	j3	LJFL added/changed in assemblies
	j4	Threaded flanges deleted DN 150
	j5	WN flange range extended
	j6	SO flanges deleted
Level gauges	l1	Gaskets changed
Notes	n1	Note added
Orifice	o1	MESC no. changed DN 100-150
Pipe	p1	API 5L-B pipe added
	p2	Material DN 300 changed to A358
	p3	Material DN 450 - 600 changed
	p4	MESC no. DN 450-600 changed (welded)
	p5	Range description corrected
	p6	Spools/spacers deleted
	p7	Nipple length corrected
	p8	Nipple length 100 mm limited
Thermowell	t1	Type changed to "straight"
Union	u1	Deleted
Valves	v1	Butterfly valves changed
	v2	Valve selection changed
	v3	Check valve range extended
	v4	Check valves MESC no. corrected
	v5	Diaphragm valves deleted
	v6	Gate valves changed to RF
	v7	Gate valve range extended
	v8	Gate valve flanged DN 15-50 added
	v9	Gate valves MESC no. corrected
	v10	Globe valves MESC no. added
	v11	Globe valves MESC no. corrected
	v12	Material description corrected
	v13	SW valves deleted
Y-type strainers	y1	MESC no. changed (recalculation)
	y2	Range extended

2 SUMMARY OF ISSUED PIPING CLASSES

Material	Piping class no.	ASME class rating					
		150	300	600	900	1500	2500
Carbon steel	1011	x	x	x	x	x	x
	1012		x				
	1013		x				
	1013			x			
	1015	x	x	x	x	x	
	1021	x	x				
	1023	x	x				
	1025	x	x				
	1031	x	x	x	x	x	x
	1041	x	x	x	x	x	
	1042	x	x	x	x	x	
	1055	x	x	x	x	x	
	1071		x	x	x	x	
	1076		x	x		x	x
	1091	x	x				
	1125	x	x				
	1126	x	x				
	1131		x				
	1160		x				
	1172	x	x	x	x		
	1173	x	x	x			
	1175	x	x				
	1176	x	x				
	1201	x					
	1261	x	x	x	x	x	
	1271		x				
	1300	x	x				
	1310		x				
	1371			x			
	1372	x	x				
	1373	x	x				
Low alloy steel	2010		x	x	x		
	2020		x	x	x	x	
	2021		x				
	2040	x	x	x			x
	2080	x	x				
	2110		x	x	x		
	2120			x	x		
Stainless steel	3011	x	x	x			
	3021	x	x	x	x		x
	3031	x	x				
	3050		x	x	x	x	
	3055		x	x	x		x
	3090			x			
	3091	x	x				
	3100	x	x				
Copper and copper alloys	5011	x					
Nickel and nickel base alloys	6021	x					
	6071	x	x				
	6080		x				

2. SUMMARY OF ISSUED PIPING CLASSES (continued)

Material	Piping class no.	ASME class rating					
		150	300	600	900	1500	2500
Non-metallic	7010	x					
	7070	x					
	7075	x					
	7101	x					
	7120	x					
	7200	x					
	7210	x					
	7220	x					
	7230	x					
	7310	x					
	7320	x					
Carbon steel galvanised Carbon steel lined	8011	x					
	8040	x					
	8070	x					
	8081	x					
	8101	x					
	8120	x					
	8160	x					

3. SERVICE INDEX

WHERE THE SERVICE IS NOT SPECIFICALLY DEFINED BELOW, AND FOR FINAL SELECTION OF MATERIALS, A MATERIALS ENGINEER SHALL BE CONSULTED

Service		Recommended			Remarks	See Note
Medium	Properties	Temp. limits (°C)	Piping class(es)			
Acetic acid	All concentrations	0 - 100	3021	3031*	Moderate Sour High Sour	10 7 7 7 3,7 3,7
Acetone		0 - 100	1011	1021*		
Acetonitrile		0 - 130	1011	1021*		
Air	Instrument, Tool	0 - 200	1011	1021*		
Air	Instrument, Tool	0 - 100	8011			
Allyl chloride	Wet	0 - 20	7010			
Amine	Lean	0 - 140	1013	1023*		
Amine	Rich CO2	0 - 80	1013	1023*		
Amine	Rich CO2	80 - 95	1371	1372*		
Amine	Rich H2S	0 - 110	1013	1023*		
Amine	with high severity HIC	0 - 140	1025			
Benzene		0 - 85	1011	1021*		
Butanol		0 - 200	1011	1021*		
Butanol		0 - 40	7010			
Carbon dioxide	Dry	0 - 350	1011			
Carbon dioxide	Wet	0 - 100	3011	3021 3031*		
			7010		to prevent product contamination	10
Chlorine	Gas, dry	-35 - 70	1271			10
Chlorine	Gas, wet	0 - 80	7210	8040		4,5
Chlorine	Gas, wet	0 - 200	8160			10
Chlorine	Liquid, dry	-35 - 70	1271			4,5
Condensate	Steam non-aerated	0 - 250	1261			
Coolant	60/40 % H2O/Methanol	-50 - 50	1172			
Diethylene glycol	All concentrations, Dry	0 - 150	1011	1021*	to prevent product contamination	
Diethylene glycol		0 - 150	3021	3031*		
Dimethylketone	Water	0 - 100	1011	1021*	final product DPP plant	
Diphenyl propane		0 - 140	3021	3031*		
Ethane		-90 - 150	3090	3091*		4
Ethanol		0 - 100	1011	1021		
Ethylene		-140 - 150	3090	3091*		4
Ethylene oxide	CO2, water	0 - 150	3100			
Ethylene oxide		0 - 50	1300			
Ethylene oxide		0 - 200	3100			
Foam, fire fighting	Concentrate, solution	0 - 50	3021	3031* 7101	DN 15-80	10
Formic acids	All concentrations	0 - 30	3021	3031* 7220		10
Heat transfer fluid	Dowtherm	0 - 390	1011			
Hydrocarbons	non-corrosive	0 - 200	1021			9,12
Hydrocarbons	non-corrosive	0 - 330	1011			9,12
Hydrocarbons	LPG	0 - 200	1011	1021*		9
Hydrocarbons	LPG with mod. sev. wet H2S	0 - 200	1041		Moderate Sour	3, 9
Hydrocarbons	LPG with or without wet H2S	-50 - 150	1172		Low Temp, Non-Sour or Moderate Sour	3,4,9
Hydrocarbons	with mod. sev. wet H2S	0 - 200	1041		Moderate Sour	3,9
Hydrocarbons	with high severity HIC	0 - 200	1015	1125*	High Sour	3,9
Hydrocarbons	with S and/or NA	0 - 240	1011			9,13
Hydrocarbons	with S and/or NA	240 - 330	1042		corrosion rate must be checked	9,13,14
Hydrocarbons	with S and/or NA	240 - 450	2040		corrosion rate must be checked	9,13,14
Hydrochloric acid						8
Hydrochloric acid	concentration <37%	0 - 80	7200			10
Hydrogen	with or without wet H2S	0 - 230	1071	1131*	Moderate Sour	3
Hydrogen	no H2S	230 - 450	2110	2120	Check API 941 for pres./temp. limit	8
Hydrogen	with H2S	230 - 538	3055			
Hydrogen chloride	Gas, dry	0 - 100	1011	1021*		
Hydrogen chloride	Gas, wet	0 - 50	7010			10
Hydrogen fluoride		0 - 200	1310	6080		8,15
Hydrogen peroxide	Up to 98%					8
Hydrogen sulphide	Gas, dry	0 - 200	1041			

SERVICE INDEX (continued)

WHERE THE SERVICE IS NOT SPECIFICALLY DEFINED BELOW, AND FOR FINAL SELECTION OF MATERIALS, A MATERIALS ENGINEER SHALL BE CONSULTED

Service		Recommended				Remarks	See Note	
Medium	Properties	Temp. limits (°C)	Piping class(es)					
Isobutyl alcohol	Finished product	0 - 100	1011	1021*	3011	to prevent product contamination	4	
Isopropyl alcohol		0 - 100	1011	1021*				
Luboil and Seal Oil		0 - 200	3021	3031*				
Methane		-200 - 150	3091					
Methanol	Liquid	0 - 100	1011	1021*	3011	to prevent product contamination	4	
Methanol		-50 - 150	1172					
Methyl ethyl ketone		0 - 100	1011	1021*				
Nitrogen		-200 - 150	3091					
Nitrogen	Thermal	0 - 340	1011		3011	to prevent product contamination	6,8	
Nitrogen		0 - 200	1021					
Oil		0 - 400	1160					
Oxygen								
Phenol	All concentrations	0 - 200	1011	1021*	3011	to prevent product contamination	8	
Phenol		0 - 150	3021	3031*				
Phosphoric acid								
Polyols		Acidic or Alkaline	0 - 200	3021				3031*
Polyols	Unfinished neutral product	0 - 150	1011	1021*	3011	to prevent product contamination	8,16	
Polypropylene		0 - 200	1011	1021*				
Potassium hydroxide								
Propylene		Liquid	-100 - 150	3091				
Secondary butyl alcohol		0 - 200	1011	1021*	3011	to prevent product contamination	4	
Sodium hydroxide								
Sodium hypochloride		Concentration < 18%	0 - 50	7230				
Steam		Saturated / Superheated	0 - 400	1261				
Steam	Superheated	400 - 450	2020		3011	to prevent product contamination	8,16	
Steam		400 - 538	2010	2050				
Sulphur		Dry	0 - 150	1011				1021*
Sulphur trioxide		Dry Gas	0 - 340	1011				
Sulphuric acid	All concentrations				3011	to prevent product contamination	8,17	
Water, boiler feed		Demineralized aerated	0 - 150	3021				3031*
Water, boiler feed		Treated non-corrosive	0 - 250	1261				
Water, boiler feed			0 - 90	7010				
Water, boiler feed	Brackish- / Seawater	0 - 75	8040		3011	for existing systems only for above ground systems only	10	
Water, cooling		0 - 50	5011					
Water, cooling		Brackish- / Seawater	-5 - 60	7320				
Water, cooling		Sweet	0 - 50	1201				7310
Water, cooling	Chlorinated sea	-5 - 60	7320		3011	for existing systems only for above ground systems only	10	
Water, wash down		Brackish- / Seawater	-5 - 60	7320				
Water, demineralized		0 - 80	3021	3031*				
Water, demineralized		0 - 80	7010					
Water, demineralized	Process Use	0 - 80	8040		3011	for existing sysytems only	10	
Water, fire fighting		Brackish- / Seawater	-5 - 50	7120				
Water, fire fighting		Brackish- / Seawater	0 - 50	8101				
Water, fire fighting		Chlorinated seawater	0 - 50	7120				
Water, fire fighting	Fresh	0 - 50	1201		3011	check oxygen and corrosion rate/life	11	
Water, fire fighting		0 - 50	7101					
Water, fire fighting		0 - 50	7101	8011				
Water, fire fighting		Piping normally dry	0 - 50	7101				
Water, potable		0 - 40	7070		3011	for above ground systems only for above ground systems only for underground systems only	10	
Water, potable		0 - 40	7075					
Water, sour		with mod. sev. wet H2S	0 - 200	1042				
Water, sour		with high severity HIC	0 - 200	1055				1126

General notes for Service Index:

- * Ball valve class preferred by most Chemical Plants and/or for services requiring frequent valve operations.
- Piping classes 31011 and 31012 are interchangeable

Notes for Service Index

- 1) not used
- 2) not used
- 3) For the definition of "High Sour" and "Moderate Sour", see DEP 31.38.01.11-Gen., Appendix 10.
For new construction and/or modifications to existing piping, this Appendix should be used to determine the severity of the wet H₂S process environment and the piping class/materials selected accordingly, taking into account economics and material availability.
- 4) See DEP 30.10.02.31-Gen. for low temperature service.
- 5) See DEP 31.38.01.11-Gen., Appendix 10 for piping in dry chlorine service.
- 6) See also DEP 31.10.11.31-Gen for gaseous oxygen systems.
- 7) Amine includes ADIP, MEA, DEA, AD, TEA and sulfinol:
H₂S case = $H_2S/CO_2 > 0.01$ for gas phase, > 0.02 for liquid phase;
CO₂ case = $H_2S/CO_2 < 0.01$ for gas phase, > 0.02 for liquid phase.
- 8) Selection shall be carried out by materials engineer on the basis of the specific process conditions.
- 9) Hydrocarbon service includes aviation alkylate, LPG, C1-C4, paraffins and olefins, fuel gas, fuel oil, gasoil, gasoline, isopentane, luboil, naphtha, pentane, toluene and xylene.
- 10) See DEP 31.40.10.19-Gen. for the use of GRP piping.
- 11) See DEP 80.47.10.30-Gen. for fire fighting installations.
- 12) H₂ pp < 7 bar; wet H₂S < 50 mg/kg; wet HCN < 20 wppm; S < 0.3 wt. %; TAN < 0.3; H₂S < 0.01 mol. %
- 13) S = Sulphur, NA = Naphthenic Acids.
- 14) Consult a materials engineer for a check on the high temperature sulphidation corrosion rate and select materials accordingly.
- 15) See DEP 31.38.01.11-Gen., Appendix 10 for piping in hydrofluoric acid service.
- 16) See DEP 31.38.01.11-Gen., Appendix 10 for piping in sodium hydroxide (caustic soda) service. The same requirements are applicable to potassium hydroxide service.
- 17) See DEP 31.38.01.11-Gen., Appendix 10 for piping in sulphuric acid service.

4. INDEX OF PIPING CLASSES

4.1 MATERIALS SELECTION

Material				Diameter		Sour	PWHT	Hydrogen	Low	Other	Design	Piping
Group	Pipe (1)	Valve Trim Gate, Globe, Check	Valve Internal Ball	CA mm	(DN) Min Max	Service (2)	(3)	Service (4)	Temp.	Information	Temp. °C Min Max	Class Number
1	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600						0 400	11011
2	CS	ASTM A106-B	AISI 410 *)	1	15 600						0 400	31011
3	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600					Derated P/T rating	0 400	31012
4	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600						0 400	61011
5	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 400						0 400	91011
6	CS	ASTM A106-B	AISI 410 *)	1	15 400						0 400	151011
7	CS	ASTM A106-B	AISI 410 *)	1	15 300						0 400	251011
8	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600						0 200	11021
9	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600						0 200	31021
10	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600					Fire fighting water	0 60	11201
11	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600					Steam	0 400	11261
12	CS	API 5L-B/ASTM A106-B	AISI 316+St 6	1	15 600					Steam	0 400	31261
13	CS	API 5L-B/ASTM A106-B	AISI 316+St 6	1	15 400					Steam	0 400	61261
14	CS	API 5L-B/ASTM A106-B	AISI 316+St 6	1	15 400					Steam	0 400	91261
15	CS	ASTM A106-B	AISI 316+St 6	1	15 400					Steam	0 400	151261
16	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600					EO	0 200	11300
17	CS	API 5L-B/ASTM A106-B	AISI 410 *)	1	15 600					EO	0 200	31300
18	CS	ASTM A106-B	AISI 316+St 6	1	15 600					Thermal oil	0 400	31160
19	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.					0 400	11041
20	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.					0 400	31041
21	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.					0 400	61041
22	CS	ASTM A106-B	AISI 316+St 6	1	15 400	Mod.					0 400	91041
23	CS	ASTM A106-B	AISI 316+St 6	1	15 400	Mod.					0 400	151041
24	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.		Hydrogen			0 200	31131
25	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.		Hydrogen			0 400	31071
26	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.		Hydrogen			0 400	61071
27	CS	ASTM A106-B	AISI 316+St 6	1	15 400	Mod.		Hydrogen			0 400	91071
28	CS	ASTM A106-B	AISI 316+St 6	1	15 200	Mod.		Hydrogen			0 400	151071
29	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.	PWHT				0 200	11023
30	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.	PWHT				0 200	31023
31	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.	PWHT				0 400	31013
32	CS	ASTM A106-B	AISI 316+St 6	1	15 600	Mod.	PWHT				0 400	61013
33	CS	ASTM A106-B	AISI 316+St 6	1	15 600	High					0 200	11125
34	CS	ASTM A106-B	AISI 316+St 6	1	15 600	High					0 200	31125
35	CS	ASTM A106-B	AISI 316+St 6	1	15 600	High					0 400	11015
36	CS	ASTM A106-B	AISI 316+St 6	1	15 600	High					0 400	31015
37	CS	ASTM A106-B	AISI 316+St 6	1	15 600	High					0 400	61015
38	CS	ASTM A106-B	AISI 316+St 6	1	15 400	High					0 400	91015
39	CS	ASTM A106-B	AISI 316+St 6	1	15 400	High					0 400	151015
40	CS	ASTM A106-B	AISI 410 *)	3	15 600						0 400	11031
41	CS	ASTM A106-B	AISI 410 *)	3	15 600						0 400	31031
42	CS	ASTM A106-B	AISI 410 *)	3	15 600						0 400	61031
43	CS	ASTM A106-B	AISI 410 *)	3	15 400						0 400	91031
44	CS	ASTM A106-B	AISI 410 *)	3	15 400						0 400	151031

MATERIALS SELECTION (continued)

Material				Diameter		Sour	PWHT	Hydrogen	Low	Other	Design	Piping
Group	Pipe (1)	Valve Trim Gate, Globe, Check	Valve Internal Ball	CA mm	(DN) Min Max	Service (2)	(3)	Service (4)	Temp.	Information	Temp. °C Min Max	Class Number
45	CS	ASTM A106-B	AISI 410 *	3	15 300						0 400	251031
46	CS	ASTM A106-B	AISI 316+St 6	3	15 600			Hydrogen			0 400	31076
47	CS	ASTM A106-B	AISI 316+St 6	3	15 600			Hydrogen			0 400	61076
48	CS	ASTM A106-B	AISI 316+St 6	3	15 400						0 400	151076
49	CS	ASTM A106-B	AISI 316+St 6	3	15 500			Hydrogen			0 400	251076
50	CS	ASTM A106-B	Alloy 20 - PTFE	3	15 300					Sulphuric acid	0 65	11091
51	CS	ASTM A106-B	Alloy 20 - PTFE	3	15 300					Sulphuric acid	0 65	31091
52	CS	ASTM A106-B	AISI 316+St 6	3	15 600						0 200	11373
53	CS	ASTM A106-B	AISI 316+St 6	3	15 600						0 200	31373
54	CS	ASTM A106-B	AISI 316+St 6	3	15 600	Mod.					0 400	11042
55	CS	ASTM A106-B	AISI 316+St 6	3	15 600	Mod.					0 400	31042
56	CS	ASTM A106-B	AISI 316+St 6	3	15 600	Mod.					0 400	61042
57	CS	ASTM A106-B	AISI 316+St 6	3	15 400	Mod.					0 400	91042
58	CS	ASTM A106-B	AISI 316+St 6	3	15 400	Mod.					0 400	151042
59	CS	ASTM A106-B	AISI 316+St 6	3	15 600	Mod.	PWHT				0 200	11372
60	CS	ASTM A106-B	AISI 316+St 6	3	15 600	Mod.	PWHT				0 200	31372
61	CS	ASTM A106-B	AISI 316+St 6	3	15 600	Mod.	PWHT				0 400	61371
62	CS	ASTM A106-B	AISI 316+St 6	3	15 600	High					0 400	11055
63	CS	ASTM A106-B	AISI 316+St 6	3	15 600	High					0 400	31055
64	CS	ASTM A106-B	AISI 316+St 6	3	15 600	High					0 400	61055
65	CS	ASTM A106-B	AISI 316+St 6	3	15 400	High					0 400	91055
66	CS	ASTM A106-B	AISI 316+St 6	3	15 400	High					0 400	151055
67	CS	ASTM A106-B	AISI 316+St 6	3	15 600	High					0 200	11126
68	CS	ASTM A106-B	AISI 316+St 6	3	15 600	High					0 200	31126
69	CS	ASTM A106-B	AISI 316+St 6	3	15 600	High	PWHT			Amine	0 210	11025
70	CS	ASTM A106-B	AISI 316+St 6	3	15 600	High	PWHT			Amine	0 210	31025
71	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 600	Mod.			LT		-50 200	11172
72	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 600	Mod.			LT		-50 200	31172
73	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 400	Mod.			LT		-50 340	61172
74	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 300	Mod.			LT		-50 340	91172
75	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 600	Mod.	PWHT		LT		-50 200	11173
76	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 600	Mod.	PWHT		LT		-50 200	31173
77	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 400	Mod.	PWHT		LT		-50 340	61173
78	CS Fine-grained	ASTM A333-6	Monel 400 - PTFE	1	15 150	Mod.			LT	Chlorine	-35 70	31271
79	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 600	High			LT		-50 340	11175
80	CS Fine-grained	ASTM A333-6	AISI 316+St 6	1	15 600	High			LT		-50 340	31175
81	CS Fine-grained	ASTM A333-6	AISI 316+St 6	3	15 600	High			LT		-50 340	11176
82	CS Fine-grained	ASTM A333-6	AISI 316+St 6	3	15 600	High			LT		-50 340	31176
83	CS Fine-grained	ASTM A333-6	Monel 400	3	20 450		PWHT			HF acid	-15 200	31310
84	AS (0.5Mo)	ASTM A335-P1/ A672-L70 Cl. 22	AISI 316+St 6	1	15 600						0 450	12080
85	AS (0.5Mo)	ASTM A335-P1/ A672-L70 Cl. 22	AISI 316+St 6	1	15 600						0 450	32080
86	AS (1.25Cr-0.5Mo)	ASTM A335-P11/ A691-1.25Cr Cl. 22	AISI 316+St 6	1	15 600						0 450	32010
87	AS (1.25Cr-0.5Mo)	ASTM A335-P11	AISI 316+St 6	1	15 400						0 450	92010
88	AS (1.25Cr-0.5Mo)	ASTM A335-P11/ A691-1.25Cr Cl. 22	AISI 316+St 6	1	15 600						0 450	62010

MATERIALS SELECTION (continued)

Material				Diameter		Sour	PWHT	Hydrogen	Low	Other	Design	Piping
Group	Pipe (1)	Valve Trim Gate, Globe, Check	Valve Internal Ball	CA mm	(DN) Min Max	Service (2)	(3)	Service (4)	Temp.	Information	Temp. °C Min Max	Class Number
89	AS (1.25Cr-0.5Mo)	ASTM A335-P11/ A691-1.25Cr Cl. 22	AISI 316+St 6	1	15 600					Steam	0 450	32020
90	AS (1.25Cr-0.5Mo)	ASTM A335-P11/ A691-1.25Cr Cl. 22	AISI 316+St 6	1	15 600					Steam	0 450	62020
91	AS (1.25Cr-0.5Mo)	ASTM A335-P11	AISI 316+St 6	1	15 400					Steam	0 450	92020
92	AS (1.25Cr-0.5Mo)	ASTM A335-P11	AISI 316+St 6	1	15 300					Steam	0 450	152020
93	AS (1.25Cr-0.5Mo)	ASTM A335-P11/ A691-1.25Cr Cl. 22	AISI 316+St 6	1	15 600					Steam	0 538	32021
94	AS (1.25Cr-0.5Mo)	ASTM A335-P11/ A691-1.25Cr Cl. 22	AISI 316+St 6	1	15 600			Hydrogen			0 400	32110
95	AS (1.25Cr-0.5Mo)	ASTM A335-P11/ A691-1.25Cr Cl. 22	AISI 316+St 6	1	15 600			Hydrogen			0 400	62110
96	AS (1.25Cr-0.5Mo)	ASTM A335-P11	AISI 316+St 6	1	15 400			Hydrogen			0 400	92110
97	AS (1.25Cr-0.5Mo)	ASTM A335-P11/ A691-1.25Cr Cl. 22	AISI 316+St 6	1	15 600			Hydrogen			0 500	62120
98	AS (1.25Cr-0.5Mo)	ASTM A335-P11	AISI 316+St 6	1	15 400						0 500	92120
99	AS (2.25Cr-1.0Mo)	ASTM A335-P22	AISI 316+St 6	1	15 300					Steam	0 538	252050
100	AS (5Cr-0.5Mo)	ASTM A335-P5/ A691-5Cr Cl. 22	AISI 316+St 6	1	15 600						0 450	12040
101	AS (5Cr-0.5Mo)	ASTM A335-P5/ A691-5Cr Cl. 22	AISI 316+St 6	1	15 600						0 450	32040
102	AS (5Cr-0.5Mo)	ASTM A335-P5/ A691-5Cr Cl. 22	AISI 316+St 6	1	15 600						0 450	62040
103	SS AISI 316	ASTM A312-TP316L/ A358-316L	AISI 316+St 6	0	15 600						0 400	13021
104	SS AISI 316	ASTM A312-TP316L	AISI 316+St 6	0	15 300						0 400	33021
105	SS AISI 316	ASTM A312-TP316L	AISI 316+St 6	0	15 200						0 400	63021
106	SS AISI 316	ASTM A312-TP316L	AISI 316+St 6	0	15 150						0 400	93021
107	SS AISI 316	ASTM A312-TP316L	AISI 316+St 6	0	15 300						0 400	253021
108	SS AISI 316	ASTM A312-TP316L/ A358-316L	AISI 316+St 6	AISI 316 - PTFE	0 15 600						0 200	13031
119	SS AISI 316	ASTM A312-TP316L	AISI 316+St 6	AISI 316 - PTFE	0 15 300						0 200	33031
110	SS AISI 316	ASTM A312-TP316L/ A358-316L	AISI 316+St 6	AISI 316 - PTFE	0 15 600					EO	0 200	13100
111	SS AISI 316	ASTM A312-TP316L	AISI 316+St 6	AISI 316 - PTFE	0 15 300					EO	0 200	33100
112	SS AISI 304 LT	ASTM A312-TP304/ A358-304	AISI 316+St 6	AISI 316 - PTFE	0 15 600				LT		-200 150	13091
113	SS AISI 304 LT	ASTM A312-TP304	AISI 316+St 6	AISI 316 - PTFE	0 15 300				LT		-200 150	33091
114	SS AISI 304 LT	ASTM A312-TP304/ A358-304	AISI 316+St 6		0 15 600				LT		-200 150	63090
115	SS AISI 321 Stab	ASTM A312-TP321 Stab	AISI 321Stab+St 6		0 15 300						0 538	33055
116	SS AISI 321 Stab	ASTM A312-TP321 Stab/ A358-321 Stab	AISI 321Stab+St 6		0 15 600						0 538	63055
117	SS AISI 321 Stab	ASTM A312-TP321 Stab	AISI 321Stab+St 6		0 15 300						0 538	93055
118	SS AISI 321 Stab	ASTM A312-TP321 Stab/ A358-321 Stab	AISI 321Stab+St 6		0 15 600						0 538	253055
119	SS AISI 321/347	ASTM A312-TP321/347/ A358-321/347	AISI 321+St 6		0 15 600						0 400	13011
120	SS AISI 321/347	ASTM A312-TP321/347	AISI 321+St 6		0 15 300						0 400	33011
121	SS AISI 321/347	ASTM A312-TP321/347	AISI 321+St 6		0 15 300						0 400	63011
122	SS AISI 321/347	ASTM A312-TP321/347	AISI 321+St 6		0 15 300						0 450	33050
123	SS AISI 321/347	ASTM A312-TP321/347	AISI 321+St 6		0 15 300						0 450	63050
124	SS AISI 321/347	ASTM A312-TP321/347	AISI 321+St 6		0 15 150						0 450	93050
125	SS AISI 321/347	ASTM A312-TP321/347	AISI 321+St 6		0 15 100						0 450	153050
126	Aluminium Brass	ASTM B111 UNS C68700	Al-Bronze		0 15 100						0 50	15011
127	Hastelloy B2	ASTM B622 UNS N10665	Hastelloy B2	Hastelloy B2 - PTFE	0 15 200						0 200	16071
128	Hastelloy B2	ASTM B622 UNS N10665	Hastelloy B2	Hastelloy B2 - PTFE	0 15 150						0 200	36071
129	Monel 400	ASTM B165 UNS N04400	Monel 400	Monel 400 - PTFE	1 15 200						0 150	16021
130	Monel 400	ASTM B165 UNS N04400	AISI 316+St 6		0 20 200					HF acid	0 200	36080
131	GRE	GRE-Aromatic Amine		Aluminium - PTFE	0 25 600						0 110	17010
132	GRE	GRE-Aliphatic Amine		Aluminium - PTFE	0 25 300						0 85	17070

MATERIALS SELECTION (continued)

Material				Diameter		Sour	PWHT	Hydrogen	Low	Special	Design	Piping
Group	Pipe (1)	Valve Trim Gate, Globe, Check	Valve Internal Ball	CA mm	(DN) Min Max	Service (2)	(3)	Service (4)	Temp.	Application	Temp. °C Min Max	Class Number
133	GRE	GRE-Aliphatic amine with aluminium foil	Aluminium - PTFE	0	25 300						0 85	17075
134	GRE	GRE-Aliphatic amine	AISI 410 *)	0	100 600						0 85	17101
135	GRE	GRE-Aliphatic amine		0	100 600						-5 85	17120
136	GRVE	GRVE-Novolac epoxy	Aluminium - PTFE	0	25 600						0 100	17200
137	GRVE	GRVE-Bisphenol A	Aluminium - PTFE	0	25 600						0 100	17210
138	GRVE	GRVE-Novolac epoxy	Aluminium - PTFE	0	25 600						0 100	17220
139	GRVE	GRVE-Bisphenol A	Aluminium - PTFE	0	25 600						0 80	17230
140	GRUP	GRUP-Isophthalic	AISI 410 *)	0	100 600						0 60	17310
141	GRUP	GRUP-Isophthalic		0	100 600						-5 60	17320
142	CS (Galvanised)	Carbon steel (Galvanised)	Al-Bronze	0	15 250						0 100	18011
143	CS (Galvanised)	Carbon steel (Galvanised)	AISI 316 - PTFE	0	15 50						0 200	18081
144	CS (Galvanised)	Carbon steel (Galvanised)	Al-Bronze - PTFE	0	15 400						0 60	18101
145	CS (Glass lined)	Carbon steel (Glass lined)	Aluminium - PTFE	0	25 300						40 100	18120
146	CS (Polyprop lined)	Carbon steel (Polyprop lined)	Aluminium - PTFE	0	25 200						0 100	18070
147	CS (PTFE lined)	Carbon steel (PTFE lined)	Aluminium - PTFE	0	25 200						0 150	18160
148	CS (Rubber lined)	Carbon steel (Rubber lined)	Aluminium - PTFE	0	25 200						0 80	18040

NOTES:

- *) AISI 316+stellite 6 for sizes DN 15 to DN 40
- (1) In this column, where pipe material API 5L-B/ASTM A106-B is indicated, the piping class includes both API 5L Grade B pipe (welded and seamless) and ASTM A106 Grade B pipe (seamless). The most economic material selection is API 5L Grade B welded pipe (ERW or SAW) and the piping class has been checked to show that this material may be used interchangeably without de-rating. ASTM A106 Grade B or API 5L Grade B seamless is provided as an option in the piping class.
 - (2) This column indicates whether the piping class is suitable for "sour" service. Classes indicated as "Mod" are suitable for "Moderate Sour" service and include standard piping material specifications. Classes designated as "High" are suitable for "High Sour" service and include special material specifications and testing. Both types of piping class are also fully suitable for non-sour services. Both types of piping class contain the same valve specifications.
 - (3) This column indicates whether the piping class requires postweld heat treat ment (PWHT) for process reasons. In addition to PWHT of all shop and fields welds, valves are specified with PWHT of all welds (including repairs and internals).
 - (4) This column indicates whether the piping class has valves suitable for "hydrogen service" (i.e. partial pressure of hydrogen greater than 7 bar (abs)).

4.2 VALVE, GASKET AND BOLT SELECTION

Piping	Ball valve			Plug valve			Gate valve			Butterfly valve		Check valve		Globe valve			Gasket			Bolts
	Class Number	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	type	inner ring	outer ring	filler material	
1	11011				SW 015 040	RF 015 600				SW 015 040	RF 015 600	SW 015 040	RF 015 200			TI			graphite	B7
2	31011				SW 015 040	RF 015 600				SW 015 040	RF 015 600	SW 015 040	RF 015 200			TI			graphite	B7
3	31012				SW 015 040	RF 015 600				SW 015 040	RF 015 600	SW 015 040	RF 015 200			TI			graphite	B7
4	61011				SW 015 040	RF 015 600				SW 015 040	RF 015 600	SW 015 040	RF 015 150			SPW		CS	graphite	B7
5	91011				RF 015 400					RF 015 400			RF 015 150			SPW	316(L)	CS	graphite	B7
6	151011				RF 015 400					RF 015 400			RF 015 100			SPW	316(L)	CS	graphite	B7
7	251011				BW 015 040	RF 015 300				RF 015 300			BW 015 040	RF 015 100		SPW	316(L)	CS	graphite	B7
8	11021	RFrb 015 250			RF 150 600					SW 015 040	RF 015 600	SW 015 040	RF 015 200			TI			graphite	B7
9	31021	RFrb 015 250			RF 150 600					SW 015 040	RF 015 600	SW 015 040	RF 015 200			TI			graphite	B7
10	11201	RFrb 015 250			RF 150 600				WL 050 600	RF 015 600	WL 050 600	RF 015 200				TI			graphite	B7
11	11261				SW 015 040	SWb 015 040	RF 015 600			SW 015 040	RF 015 600	SWb 015 040	SW 015 040	RF 015 200		SPW		CS	graphite	B7
12	31261				SWb 015 040	SW 015 040	RF 015 600			SW 015 040	RF 015 600	SWb 015 040	SW 015 040	RF 015 200		SPW		CS	graphite	B7
13	61261				SW(b)015 040	BW 050 400	RF 015 050			SW 015 040	BW 050 400	SWb 015 040	SW 015 040	BW 050 150		SPW		CS	graphite	B7
14	91261				BWb 015 040	BW 015 400	RF 015 050			BW 015 400		BWb 015 040	BW 015 150			SPW	316(L)	CS	graphite	B7
15	151261				BWb 015 040	BW 015 400	RF 015 050			BW 015 400		BWb 015 040	BW 015 100			SPW	316(L)	CS	graphite	B7
16	11300	RFrb 015 250			RF 300 600					RF 015 040	WL 050 600	RFb 015 200				SPW	316(L)	CS	graphite	B7
17	31300	RFrb 015 250			RF 300 600					RF 015 040	WL 050 600	RFb 015 200				SPW	316(L)	CS	graphite	B7
18	31160				BW(b) 015 040	RF 015 600						BWb 015 040	RF 050 200			SPW	316(L)	CS	graphite	B7
19	11041				RF 015 600					RF 015 600			RF 015 200			TI			graphite	B7
20	31041				RF 015 600					RF 015 600			RF 015 200			TI			graphite	B7
21	61041				RF 015 600					RF 015 600			RF 015 150			SPW		CS	graphite	B7
22	91041				RF 015 400					RF 015 400			RF 015 150			SPW	316(L)	CS	graphite	B7
23	151041				RF 015 400					RF 015 400			RF 015 100			SPW	316(L)	CS	graphite	B7
24	31131	RFrb 015 250			RF 150 600					RF 015 600			RF 015 200			TI			graphite	B7
25	31071				RF 015 600					RF 015 600			RF 015 200			TI			graphite	B7
26	61071				BW 015 600	RF 015 050				BW 015 600			BW 015 150			SPW		CS	graphite	B7
27	91071				BW 015 400	RF 015 050				BW 015 400			BW 015 150			SPW	316(L)	CS	graphite	B7
28	151071				BW 015 200	RF 015 050				BW 015 200			BW 015 100			SPW	316(L)	CS	graphite	B7
29	11023	RFrb 015 250			RF 150 600					RF 015 600			RF 015 200			TI			graphite	B7
30	31023	RFrb 015 250			RF 150 600					RF 015 600			RF 015 200			TI			graphite	B7
31	31013				RF 015 600					RF 015 600			RF 015 200			TI			graphite	B7
32	61013				RF 015 600					RF 015 600			RF 015 150			SPW		CS	graphite	B7
33	11125	RFrb 015 250			RF 150 600					BW 015 040	RF 015 600	BW 015 040	RF 015 200			TI			graphite	B7M
34	31125	RFrb 015 250			RF 150 600					BW 015 040	RF 015 600	BW 015 040	RF 015 200			TI			graphite	B7M
35	11015				BW 015 040	RF 015 600				BW 015 040	RF 015 600	BW 015 040	RF 015 200			TI			graphite	B7M
36	31015				BW 015 040	RF 015 600				BW 015 040	RF 015 600	BW 015 040	RF 015 200			TI			graphite	B7M
37	61015				BW 015 040	RF 015 600				BW 015 040	RF 015 600	BW 015 040	RF 015 150			SPW		CS	graphite	B7M
38	91015				BW 015 040	RF 015 400				BW 015 040	RF 015 400	BW 015 040	RF 015 150			SPW	316(L)	CS	graphite	B7M
39	151015				BW 015 040	RF 015 400				RF 015 400	BW 015 040	BW 015 040	RF 015 100			SPW	316(L)	CS	graphite	B7M
40	11031				RF 015 600					RF 015 600			RF 015 200			TI			graphite	B7
41	31031				RF 015 600					RF 015 600			RF 015 200			TI			graphite	B7
42	61031				RF 015 600					RF 015 600			RF 015 150			SPW		CS	graphite	B7
43	91031				RF 015 400					RF 015 400			RF 015 150			SPW	316(L)	CS	graphite	B7
44	151031				RF 015 400					RF 015 400			RF 015 100			SPW	316(L)	CS	graphite	B7

VALVE, GASKET AND BOLT SELECTION (continued)

	Piping	Ball valve				Plug valve		Gate valve				Butterfly valve		Check valve		Globe valve			Gasket			Bolts
		Class Number	size DN type min max		size DN type min max		size DN type min max		size DN type min max		size DN type min max		size DN type min max		size DN type min max		size DN type min max		type	inner ring	outer ring	
45	251031					BW 015 300	RF 015 050				BW 015 300		BW 015 100			SPW	316(L)	CS	graphite	B7		
46	31076					RF 015 600					RF 015 600		RF 015 200			TI			graphite	B7		
47	61076					BW 015 600	RF 015 050				BW 015 600		BW 015 150			SPW		CS	graphite	B7		
48	151076					BW 015 400	RF 015 050				BW 015 400		BW 015 100			SPW	316(L)	CS	graphite	B7		
49	251076					BW 015 150					BW 015 150		BW 015 100			SPW	316(L)	CS	graphite	B7		
50	11091	RFfb 015 300									RF 025 300		RF 015 200			RF			PTFE	B7		
51	31091	RFfb 015 300									RF 025 300		RF 015 200			RF			PTFE	B7		
52	11373	RFrb 015 250				RF 150 600					RF 015 600		RF 015 200			TI			graphite	B7		
53	31373	RFrb 015 250				RF 150 600					RF 015 600		RF 015 200			TI			graphite	B7		
54	11042					RF 015 600					RF 015 600		RF 015 200			TI			graphite	B7		
55	31042					RF 015 600					RF 015 600		RF 015 200			TI			graphite	B7		
56	61042					RF 015 600					RF 015 600		RF 015 150			SPW		CS	graphite	B7		
57	91042					RF 015 400					RF 015 400		RF 015 150			SPW	316(L)	CS	graphite	B7		
58	151042					RF 015 400					RF 015 400		RF 015 100			SPW	316(L)	CS	graphite	B7		
59	11372	RFrb 015 250				RF 150 600					RF 015 400		RF 015 200			TI			graphite	B7		
60	31372	RFrb 015 250				RF 150 600					RF 015 600		RF 015 200			TI			graphite	B7		
61	61371					RF 015 600					RF 015 600		RF 015 150			SPW		CS	graphite	B7		
62	11055					BW 015 040	RF 015 600				BW 015 040	RF 015 600	BW 015 040	RF 015 200		TI			graphite	B7M		
63	31055					BW 015 040	RF 015 600				BW 015 040	RF 015 600	BW 015 040	RF 015 200		TI			graphite	B7M		
64	61055					BW 015 040	RF 015 600				BW 015 040	RF 015 600	BW 015 040	RF 015 150		SPW		CS	graphite	B7M		
65	91055					BW 015 040	RF 015 400				BW 015 040	RF 015 400	BW 015 040	RF 015 150		SPW	316(L)	CS	graphite	B7M		
66	151055					BW 015 400	RF 015 050				BW 015 400		BW 015 100			SPW	316(L)	CS	graphite	B7M		
67	11126	RFrb 015 250				BW 015 040	RF 150 600				BW 015 040	RF 015 400	BW 015 040	RF 015 200		TI			graphite	B7M		
68	31126	RFrb 015 250				RF 150 600					RF 015 600		RF 015 200			TI			graphite	B7M		
69	11025	RFrb 015 150	RFfb 015 150							WL 150 600	RF 015 600		RF 015 200			TI			graphite	B7M		
70	31025	RFrb 015 150	RFfb 015 150							WL 150 600	RF 015 600		RF 015 200			TI			graphite	B7M		
71	11172	RFrb 015 250				RF 150 600					RF 015 600		RF 015 200			TI			graphite	L7		
72	31172	RFrb 015 250				RF 150 600					RF 015 600		RF 015 200			TI			graphite	L7		
73	61172					RF 015 400					RF 015 400		RF 015 150			SPW		CS	graphite	L7		
74	91172					RF 015 300					RF 015 300		RF 015 150			SPW	316(L)	CS	graphite	L7		
75	11173	RFrb 015 250				RF 150 600					RF 015 600		RF 015 200			TI			graphite	L7		
76	31173	RFrb 015 250				RF 150 600					RF 015 600		RF 015 200			TI			graphite	L7		
77	61173					RF 015 400					RF 015 400		RF 015 150			SPW		CS	graphite	L7		
78	31271	RFrb 015 150														TI			graphite	L7		
79	11175					RF 015 600					RF 015 600		RF 015 200			TI			graphite	L7M		
80	31175					RF 015 600					RF 015 600		RF 015 200			TI			graphite	L7M		
81	11176					RF 015 600					RF 015 600		RF 015 200			TI			graphite	L7M		
82	31176					RF 015 600					RF 015 600		RF 015 200			TI			graphite	L7M		
83	31310				RF_015_300	RF_050_300					RF_015_300		RF_015_300			SPW	Monel	CS	graphite	B7M		
84	12080					RF 015 600					RF 015 600		RF 015 200			TI			graphite	B16		
85	32080					RF 015 600					RF 015 600		RF 015 200			TI			graphite	B16		
86	32010					RF 015 600					RF 015 600		RF 015 200			TI			graphite	B16		
87	62010					RF 015 600					RF 015 600		RF 015 150			SPW		CS	graphite	B16		
88	92010					RF 015 400					RF 015 400		RF 015 150			SPW	316(L)	CS	graphite	B16		

VALVE, GASKET AND BOLT SELECTION (continued)

Piping	Ball valve				Plug valve		Gate valve				Butterfly valve		Check valve			Globe valve			Gasket			Bolts	
	Class Number	size DN		size DN		size DN		size DN		size DN		size DN		size DN		size DN		inner ring		outer ring	filler material		
		type	min	max	type	min	max	type	min	max	type	min	max	type	min	max	type	min	max	type	min	max	
89	32020					BWb 015 040		RF 015 600				RF 015 600			BWb 015 040	RF 015 200			SPW	316(L)	CS	graphite	B16
90	62020					BWb 015 040		BW 015 600	RF 015 050			BW 015 600			BWb 015 040	BW 015 150			SPW		CS	graphite	B16
91	92020					BWb 015 040		BW 015 400	RF 015 050			BW 015 400			BWb 015 040	BW 015 150			SPW	316(L)	CS	graphite	B16
92	152020					BWb 015 040		BW 015 300	RF 015 050			BW 015 300			BWb 015 040	BW 015 100			SPW	316(L)	CS	graphite	B16
93	32021					BWb 015 040		BW 015 600	RF 015 050			RF 015 600			BWb 015 040	BW 015 200			SPW	321/347	CS	graphite	B16C
94	32110					RF 015 600						RF 015 600			RF 015 200				TI			graphite	B7
95	62110					BW 015 600		RF 015 050				BW 015 600			BW 015 150				SPW		CS	graphite	B7
96	92110					BW 015 400		RF 015 050				BW 015 400			BW 015 150				SPW	316(L)	CS	graphite	B7
97	62120					BW 015 600		RF 015 050				BW 015 600			BW 015 150				SPW		CS	graphite	B16C
98	92120					BW 015 400		RF 015 050				BW 015 400			BW 015 150				SPW	316(L)	CS	graphite	B16C
99	252050					BW 015 300						BW 015 300			BW 015 100				SPW	321/347	CS	graphite	B16C
100	12040					RF 015 600						RF 015 600			RF 015 200				SPW	316(L)	CS	graphite	B16
101	32040					RF 015 600						RF 015 600			RF 015 200				SPW	316(L)	CS	graphite	B16
102	62040					RF 015 600						RF 015 600			RF 015 150				SPW	316(L)	CS	graphite	B16
103	13021					RF 015 600						RF 015 600			RF 015 200				TI			graphite	B7
104	33021					RF 015 300						RF 015 300			RF 015 200				TI			graphite	B7
105	63021					RF 015 200						RF 015 200			RF 015 150				SPW		CS	graphite	B7
106	93021					RF 015 150						RF 015 150			RF 015 150				SPW	316(L)	CS	graphite	B7
107	253021					BW 015 040		RF 015 300				RF 015 300			BW 015 040	RF 015 100			SPW	316(L)	CS	graphite	B7
108	13031	RFrb 015 250				RF 150 600						RF 015 600			RF 015 200				TI			graphite	B7
109	33031	RFrb 015 250				RF 150 300						RF 015 300			RF 015 200				TI			graphite	B7
110	13100	RFrb 015 250				RF 300 600						RF 015 040	WL 050 600		RFb 015 200				SPW	316(L)	CS	graphite	B7
111	33100	RFrb 015 250				RF 300 300						RF 015 040	WL 050 300		RFb 015 200				SPW	316(L)	CS	graphite	B7
112	13091	RFrb 015 250				RF 150 600						RF 015 400			RF 015 200				TI			graphite	B8
113	33091	RFrb 015 250				RF 150 300						RF 015 300			RF 015 200				TI			graphite	B8
114	63090					RF 015 600						RF 015 600			RF 015 150				SPW		CS	graphite	B8MX
115	33055					RF 015 300						RF 015 300			RF 015 200				SPW	316(L)	CS	graphite	B17
116	63055					BW 015 600		RF 015 050				BW 015 600			BW 015 150				SPW	316(L)	CS	graphite	B17
117	93055					BW 015 300		RF 015 050				BW 015 300			BW 015 150				SPW	316(L)	CS	graphite	B17
118	253055					BW 015 300						BW 015 300			BW 015 100				SPW	316(L)	CS	graphite	B17
119	13011					RF 015 600						RF 015 600			RF 015 200				TI			graphite	B7
120	33011					RF 015 300						RF 015 300			RF 015 200				TI			graphite	B7
121	63011					RF 015 300						RF 015 300			RF 015 150				SPW		CS	graphite	B7
122	33050					RF 015 300						RF 015 300			RF 015 200				TI			graphite	B17
123	63050					RF 015 300						RF 015 300			RF 015 150				SPW		CS	graphite	B17
124	93050					RF 015 150						RF 015 150			RF 015 150				SPW	316(L)	CS	graphite	B17
125	153050					RF 015 100						RF 015 100			RF 015 100				SPW	316(L)	CS	graphite	B17
126	15011					TH 015 050						RF 015 050			TH 015 050				FF			PTFE	B7
127	16071	RFrb 015 200				RF 015 200						RF 015 200			RF 015 200				RF			PTFE	B7
128	36071	RFrb 015 150				RF 015 150						RF 015 150			RF 015 150				RF			PTFE	B7
129	16021	RFrb 015 200				RF 015 200						RF 015 200			RF 015 200				TI			graphite	B7
130	36080					RF 015 200						RF 015 200			RF 050 200				SPW	Monel	CS	graphite	B7M
131	17010	RFrb 025 150										WL 050 600	RF 025 150						RF			EPDM	B7
132	17070	RFrb 025 150										WL 050 300	RF 025 150						RF			EPDM	B7

VALVE, GASKET AND BOLT SELECTION (continued)

Class Number	Piping	Ball valve			Plug valve			Gate valve			Butterfly valve		Check valve		Globe valve			Gasket			Bolts
		size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	size DN type min max	inner ring	outer ring	filler material	
133	17075	RFrb 025 150									WL 050 300	RF 025 150						RF		EPDM	B7
134	17101							RF 100 600			WL 100 600	WL 100 600						RF		EPDM	B7
135	17120										WL 100 600	WL 100 600						RF		EPDM	B7
136	17200	RFrb 025 150									WL 050 600	RF 025 150						RF		EPDM	B7
137	17210	RFrb 025 150									WL 050 600	RF 025 150						RF		FKM	B7
138	17220	RFrb 025 150									WL 050 600	RF 025 150						RF		IRR	B7
139	17230	RFrb 025 150									WL 050 600	RF 025 150						RF		EPDM	B7
140	17310							RF 100 600			WL 100 600	WL 100 600						RF		EPDM	B7
141	17320										WL 100 600	WL 100 600						RF		EPDM	B7
142	18011							FF 015 080	TH 015 050		WL 050 250	RF 015 050	WL 050 250	TH 015 050				FF/TI		graphite	B7
143	18081	RFrb 015 050	THrb 015 040									RF 015 050	TH 015 040	RF 015 040	TH 015 040			TI		graphite	B7
144	18101	FFrb 015 100									WL 050 400							RF		PTFE	B7
145	18120	RFfb 025 150									WL 200 300	RF 025 150						FF		PTFE	B7
146	18070	RFrb 025 200									WL 050 200	RF 025 200						RF		PTFE	B7
147	18160	RFrb 025 200									WL 050 200	RF 025 200						RF		PTFE	B7
148	18040	RFrb 025 200									WL 050 200	RF 025 200						RF		PTFE	B7

Valve Codes:

SW = socket weld end
TH = threaded end
WL = wafer lug type
RF = flanged end with raised face
FF = flanged end with flat face
b = bellows sealed
rb = reduced bore
fb = full bore

Gasket Codes:

TI = tannged insert
SPW = spiral wound gasket
RF = raised face
FF = flat face
PTFE = teflon
EPDM = ethylene propylene rubber
FKM = fluoro-elastomer
IRR = butyl rubber

Bolting Codes:

B7 = ASTM A 193 - B7
B7M = ASTM A 193 - B7M
B8 = ASTM A 193 - B8, Class 2
B8MX = ASTM A 193 - B8, Class 2B (<= 1½")
ASTM A 193 - B8M2, Class 2B (>1½")
B16 = ASTM A 193 - B16
B16C = ASTM A 193 - B16
L7 = ASTM A 320 - L7
L7M = ASTM A 320 - L7M
660 = ASTM A 453 - 660, Class A

Bolt

Nuts

ASTM A 194 - B2H
ASTM A 194 - 2HM
ASTM A 194 - 8
ASTM A 194 - 8
ASTM A 194 - 8M
ASTM A 193 - 4
ASTM A 193 - 8C
ASTM A 194 - 4
ASTM A 194 - 7M
ASTM A 453 - 660, Class A

5. PIPING CLASSES

The remainder of this binder contains the SIOP piping classes, with separate tabbed sections for ANS rating classes 150, 300, 600, 900, 1500 and 2500.

The piping classes are in numerical order within each section.

PIPING CLASSES ASME RATING 150

CLASS 11011

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - USE SPIRAL WOUND GASKETS (CLASS 11300), IF GRAPHITE TANGED INSERT GASKETS ARE NOT ALLOWED DUE TO PRODUCT CONTAMINATION
 - API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE	
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600			
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	20	80
450	C	C	C	C	E	D	D	D	E	E	E	E	E	E	A		25	80
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A			40	80
350	C	C	C	C	D	D	D	D	D	D	D	D	A				50	40
300	C	C	C	C	D	D	D	D	D	D	D	A					80	40
250	C	C	C	C	D	D	D	D	D	D	A						100	40
200	C	C	C	C	D	D	D	D	D	A							150	40
150	C	C	C	C	D	D	D	A									200	20
100	C	C	C	C	D	D	A										250	20
80	C	C	C	C	D	A											300	20
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 11011	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 11011, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B
PNPT	PIPE NIPPLE PLAIN/THREADED	---	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
CAPT	CAP THREADED	---	ASTM A105
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVS	GATE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

11011, REV.A PAGE 3

		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE (API 5L-B, SML)		74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)		74.13.14								211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	
PIPE (API 5L-B, SAW)		74.13.17																569.1
PIPE		74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	003.1	004.1	005.1	007.1												
		77.10.20					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE SOCKET WELD		77.11.04	003.1	004.1	005.1	007.1												
GATE VALVE FLANGED		77.20.04	003.1	004.1	005.1	007.1												
		77.20.20					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE SOCKET WELD		77.21.04	003.1	004.1	005.1	007.1												
GLOBE VALVE FLANGED		77.30.05	003.1	004.1	005.1	007.1												
		77.30.20					008.1	010.1	012.1	014.1	015.1							
GLOBE VALVE SOCKET WELD		77.31.04	003.1	004.1	005.1	007.1												
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.19					402.1	404.1	406.1	408.1	420.1	421.1	422.1	423.1	424.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.278.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.290.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.302.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.312.1	29.46.750.1	29.61.750.1	30.89.467.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.190.1	30.72.454.1	30.73.454.1	30.89.477.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.197.1	30.72.463.1	30.73.463.1	30.89.503.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.207.1	30.72.470.1	30.73.470.1	30.89.529.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.217.1	30.72.482.1	30.73.482.1	30.89.554.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.279.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.291.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.303.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.313.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.191.1	30.72.501.1	30.73.501.1	30.89.578.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.198.1	30.72.520.1	30.73.520.1	30.89.602.1
150* 50	79.00.814.1				450*300	79.00.208.1	30.72.550.1	30.73.550.1	30.89.626.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.218.1	30.72.581.1	30.73.581.1	30.89.650.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.228.1	30.72.611.1	30.73.611.1	30.89.674.1
200* 50	79.00.274.1				500* 50	79.00.280.1			
200* 80	79.00.286.1				500* 80	79.00.292.1			
200*100	79.00.298.1	30.72.322.1	30.73.322.1	30.89.210.1	500*100	79.00.304.1			
200*150	79.00.308.1	30.72.333.1	30.73.333.1	30.89.230.1	500*150	79.00.314.1			
250* 50	79.00.275.1				500*200	79.00.192.1	29.46.900.1	29.61.900.1	30.89.698.1
250* 80	79.00.287.1				500*250	79.00.199.1	30.72.633.1	30.73.633.1	30.89.722.1
250*100	79.00.299.1	29.46.340.1	29.61.340.1	30.89.258.1	500*300	79.00.209.1	30.72.640.1	30.73.640.1	30.89.746.1
250*150	79.00.309.1	30.72.353.1	30.73.353.1	30.89.276.1	500*350	79.00.219.1	30.72.671.1	30.73.671.1	30.89.770.1
250*200	79.00.187.1	30.72.361.1	30.73.361.1	30.89.289.1	500*400	79.00.229.1	30.72.701.1	30.73.701.1	30.89.794.1
300* 50	79.00.276.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.00.288.1				600* 50	79.00.282.1			
300*100	79.00.300.1				600* 80	79.00.294.1			
300*150	79.00.310.1	30.72.386.1	30.73.386.1	30.89.315.1	600*100	79.00.306.1			
300*200	79.00.188.1	30.72.392.1	30.73.392.1	30.89.326.1	600*150	79.00.316.1			
300*250	79.00.195.1	30.72.402.1	30.73.402.1	30.89.348.1	600*200	79.00.194.1			
350* 50	79.00.277.1				600*250	79.00.200.1	30.72.801.1	30.73.801.1	30.89.842.1
350* 80	79.00.289.1				600*300	79.00.210.1	30.72.821.1	30.73.821.1	30.89.866.1
350*100	79.00.301.1				600*350	79.00.220.1	30.72.841.1	30.73.841.1	30.89.890.1
350*150	79.00.311.1	29.46.600.1	29.61.600.1	30.89.377.1	600*400	79.00.230.1	30.72.881.1	30.73.881.1	30.89.914.1
350*200	79.00.189.1	30.72.423.1	30.73.423.1	30.89.388.1	600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*250	79.00.196.1	30.72.430.1	30.73.430.1	30.89.413.1	600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1
350*300	79.00.206.1	30.72.442.1	30.73.442.1	30.89.439.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	001.1	001.1
	200-600	002.1	002.1
20	40- 80	003.1	003.1
	100-600	004.1	004.1
25	40- 40	005.1	005.1
	50- 50	006.1	006.1
	80-100	007.1	007.1
	150-600	008.1	008.1
40	50- 50	010.1	009.1
	80- 80	011.1	010.1
	100-100	012.1	011.1
	150-300	013.1	013.1
	350-600	014.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.052.1	450	76.81.65.552.1
840	76.81.65.054.1	840	76.81.65.554.1
1230	76.81.65.056.1	1230	76.81.65.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.042.1	230	76.83.37.101.1
813	76.80.60.044.1	255	76.83.37.102.1
1219	76.80.60.046.1	305	76.83.37.103.1
1524	76.80.60.048.1	355	76.83.37.105.1
1829	76.80.60.050.1	405	76.83.37.106.1
2134	76.80.60.052.1	455	76.83.37.107.1
2438	76.80.60.054.1		
2743	76.80.60.056.1		
3048	76.80.60.058.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
15	4	1/2	*	60	61.153.1	15	4	1/2	*	70	61.155.1
20	4	1/2	*	70	61.155.1	20	4	1/2	*	70	61.155.1
25	4	1/2	*	70	61.155.1	25	4	1/2	*	80	61.157.1
40	4	1/2	*	80	61.157.1	40	4	1/2	*	80	61.157.1
50	4	5/8	*	80	61.269.1						
80	4	5/8	*	100	61.273.1						
100	8	5/8	*	100	61.273.1						
150	8	3/4	*	100	61.329.1						
200	8	3/4	*	110	61.330.1						
250	12	7/8	*	120	61.401.1						
300	12	7/8	*	120	61.401.1						
350	12	1	*	130	61.468.1						
400	16	1	*	140	61.469.1						
450	16	1 1/8	*	150	61.529.1						
500	20	1 1/8	*	160	61.530.1						
600	20	1 1/4	*	180	61.590.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
						15	4	1/2	*	70	61.155.1
						20	4	1/2	*	70	61.155.1
						25	4	1/2	*	80	61.157.1
						40	4	1/2	*	80	61.157.1
50	8	5/8	*	150	61.281.1	50	4	5/8	*	90	61.271.1
80	8	3/4	*	150	61.337.1	80	4	5/8	*	110	61.274.1
100	12	3/4	*	140	61.335.1	100	8	5/8	*	110	61.274.1
150	12	3/4	*	140	61.335.1	150	8	3/4	*	120	61.332.1
200	12	7/8	*	150	61.406.1	200	8	3/4	*	130	61.334.1
250	16	1	*	170	61.474.1	250	12	7/8	*	140	61.404.1
300	16	1 1/8	*	190	61.535.1	300	12	7/8	*	150	61.406.1
350	20	1 1/8	*	200	61.525.1	350	12	1	*	160	61.472.1
400	20	1 1/4	*	210	61.595.1	400	16	1	*	170	61.474.1
450	24	1 1/4	*	220	61.597.1	450	16	1 1/8	*	180	61.533.1
500	24	1 1/4	*	230	61.598.1	500	20	1 1/8	*	200	61.525.1
600	24	1 1/2	*	260	61.690.1	600	20	1 1/4	*	220	61.597.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0B	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.108.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.131.1	

* DRAIN POINT	DN 20	FIG.0B	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.112.1	
GATE VALVE SOCKET WELD	1	77.21.04.004.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.141.1	

* DRAIN POINT	DN 20	FIG.0A	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.112.1	
GATE VALVE SOCKET WELD	1	77.21.04.004.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.141.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0D	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE SOCKET WELD	2	77.21.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0D	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1B	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.108.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.003.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.131.1	

* VENT POINT	DN 20	FIG.1B	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.112.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.004.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.141.1	

* VENT POINT	DN 20	FIG.1A	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.112.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.004.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.141.1	

CLASS 11015

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A	20 80	
450	C	C	C	C	E	D	D	D	E	E	E	E	E	A		25 80	
400	C	C	C	C	D	D	D	D	D	D	D	D	A			40 80	
350	C	C	C	C	D	D	D	D	D	D	D	A				50 40	
300	C	C	C	C	D	D	D	D	D	D	A					80 40	
250	C	C	C	C	D	D	D	D	D	A						100 40	
200	C	C	C	C	D	D	D	D	A							150 40	
150	C	C	C	C	D	D	D	A								200 20	
100	C	C	C	C	D	D	A									250 20	
80	C	C	C	C	D	A										300 20	
50	C	C	C	B	A											350 20	
40	C	B	B	A												400 20	
25	B	B	A													450 20	
20	B	A														500 20	
15	A															600 20	

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 11015		CONSIGNEE	:	
ANS RATING : CLASS 150		ENGINEERED BY	:	
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO.	:	
REV. DATE : 12/96		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 11015, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM		76.30.54	031.1	041.1	051.1	071.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.37	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.11.14	053.1	054.1	055.1	057.1												
CHECK VALVE FLANGED		77.10.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE BUTT-WELD ENDS		77.21.14	053.1	054.1	055.1	057.1												
GATE VALVE FLANGED		77.20.04	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED		77.30.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.22					002.1	004.1	006.1	008.1	020.1	021.1	022.1	023.1	024.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.66.137.1	30.67.137.1	30.88.035.1	400* 50	79.00.278.1			
25* 15		30.66.147.1	30.67.147.1	30.88.045.1	400* 80	79.00.290.1			
25* 20		30.66.157.1	30.67.157.1	30.88.055.1	400*100	79.00.302.1			
40* 15		30.66.167.1	30.67.167.1	30.88.065.1	400*150	79.00.312.1	29.47.750.1	29.62.750.1	30.88.467.1
40* 20		30.66.177.1	30.67.177.1	30.88.075.1	400*200	79.00.190.1	30.66.454.1	30.67.454.1	30.88.477.1
40* 25		30.66.187.1	30.67.187.1	30.88.085.1	400*250	79.00.197.1	30.66.463.1	30.67.463.1	30.88.503.1
50* 20		30.66.192.1	30.67.192.1	30.88.100.1	400*300	79.00.207.1	30.66.470.1	30.67.470.1	30.88.529.1
50* 25		30.66.196.1	30.67.196.1	30.88.109.1	400*350	79.00.217.1	30.66.482.1	30.67.482.1	30.88.554.1
50* 40		30.66.206.1	30.67.206.1	30.88.118.1	450* 50	79.00.279.1			
80* 40		30.66.226.1	30.67.226.1	30.88.127.1	450* 80	79.00.291.1			
80* 50	79.00.810.1	30.66.235.1	30.67.235.1	30.88.132.1	450*100	79.00.303.1			
100* 40		30.66.250.1	30.67.250.1	30.88.145.1	450*150	79.00.313.1			
100* 50	79.00.812.1	30.66.265.1	30.67.265.1	30.88.153.1	450*200	79.00.191.1	30.66.501.1	30.67.501.1	30.88.578.1
100* 80	79.00.836.1	30.66.275.1	30.67.275.1	30.88.165.1	450*250	79.00.198.1	30.66.520.1	30.67.520.1	30.88.602.1
150* 50	79.00.814.1				450*300	79.00.208.1	30.66.550.1	30.67.550.1	30.88.626.1
150* 80	79.00.838.1	30.66.295.1	30.67.295.1	30.88.177.1	450*350	79.00.218.1	30.66.581.1	30.67.581.1	30.88.650.1
150*100	79.00.860.1	30.66.305.1	30.67.305.1	30.88.189.1	450*400	79.00.228.1	30.66.611.1	30.67.611.1	30.88.674.1
200* 50	79.00.274.1				500* 50	79.00.280.1			
200* 80	79.00.286.1				500* 80	79.00.292.1			
200*100	79.00.298.1	30.66.322.1	30.67.322.1	30.88.210.1	500*100	79.00.304.1			
200*150	79.00.308.1	30.66.333.1	30.67.333.1	30.88.230.1	500*150	79.00.314.1			
250* 50	79.00.275.1				500*200	79.00.192.1	29.47.900.1	29.62.900.1	30.88.698.1
250* 80	79.00.287.1				500*250	79.00.199.1	30.66.633.1	30.67.633.1	30.88.722.1
250*100	79.00.299.1	29.47.340.1	29.62.340.1	30.88.258.1	500*300	79.00.209.1	30.66.640.1	30.67.640.1	30.88.746.1
250*150	79.00.309.1	30.66.353.1	30.67.353.1	30.88.276.1	500*350	79.00.219.1	30.66.671.1	30.67.671.1	30.88.770.1
250*200	79.00.187.1	30.66.361.1	30.67.361.1	30.88.289.1	500*400	79.00.229.1	30.66.701.1	30.67.701.1	30.88.794.1
300* 50	79.00.276.1				500*450	79.00.250.1	30.66.731.1	30.67.731.1	30.88.818.1
300* 80	79.00.288.1				600* 50	79.00.282.1			
300*100	79.00.300.1				600* 80	79.00.294.1			
300*150	79.00.310.1	30.66.386.1	30.67.386.1	30.88.315.1	600*100	79.00.306.1			
300*200	79.00.188.1	30.66.392.1	30.67.392.1	30.88.326.1	600*150	79.00.316.1			
300*250	79.00.195.1	30.66.402.1	30.67.402.1	30.88.348.1	600*200	79.00.194.1			
350* 50	79.00.277.1				600*250	79.00.200.1	30.66.801.1	30.67.801.1	30.88.842.1
350* 80	79.00.289.1				600*300	79.00.210.1	30.66.821.1	30.67.821.1	30.88.866.1
350*100	79.00.301.1				600*350	79.00.220.1	30.66.841.1	30.67.841.1	30.88.890.1
350*150	79.00.311.1	29.47.600.1	29.62.600.1	30.88.377.1	600*400	79.00.230.1	30.66.881.1	30.67.881.1	30.88.914.1
350*200	79.00.189.1	30.66.423.1	30.67.423.1	30.88.388.1	600*450	79.00.254.1	30.66.911.1	30.67.911.1	30.88.938.1
350*250	79.00.196.1	30.66.430.1	30.67.430.1	30.88.413.1	600*500	79.00.260.1	30.66.941.1	30.67.941.1	30.88.962.1
350*300	79.00.206.1	30.66.442.1	30.67.442.1	30.88.439.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	001.1	001.1
	200-600	002.1	002.1
20	40- 80	003.1	003.1
	100-600	004.1	004.1
25	40- 40	005.1	005.1
	50- 50	006.1	006.1
	80-100	007.1	007.1
	150-600	008.1	008.1
40	50- 50	010.1	009.1
	80- 80	011.1	010.1
	100-100	012.1	011.1
	150-300	013.1	013.1
	350-600	014.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.402.1		230	76.83.37.101.1
813	76.80.60.404.1		255	76.83.37.102.1
1219	76.80.60.406.1		305	76.83.37.103.1
1524	76.80.60.408.1		355	76.83.37.105.1
1829	76.80.60.410.1		405	76.83.37.106.1
2134	76.80.60.412.1		455	76.83.37.107.1
2438	76.80.60.414.1			
2743	76.80.60.416.1			
3048	76.80.60.418.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 60	15	4	1/2	* 70
20	4	1/2	* 70	20	4	1/2	* 70
25	4	1/2	* 70	25	4	1/2	* 80
40	4	1/2	* 80	40	4	1/2	* 80
50	4	5/8	* 80				
80	4	5/8	* 100				
100	8	5/8	* 100				
150	8	3/4	* 100				
200	8	3/4	* 110				
250	12	7/8	* 120				
300	12	7/8	* 120				
350	12	1	* 130				
400	16	1	* 140				
450	16	1 1/8	* 150				
500	20	1 1/8	* 160				
600	20	1 1/4	* 180				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 70
				20	4	1/2	* 70
				25	4	1/2	* 80
				40	4	1/2	* 80
50	8	5/8	* 150	50	4	5/8	* 90
80	8	3/4	* 150	80	4	5/8	* 110
100	12	3/4	* 140	100	8	5/8	* 110
150	12	3/4	* 140	150	8	3/4	* 120
200	12	7/8	* 150	200	8	3/4	* 130
250	16	1	* 170	250	12	7/8	* 140
300	16	1 1/8	* 190	300	12	7/8	* 150
350	20	1 1/8	* 200	350	12	1	* 160
400	20	1 1/4	* 210	400	16	1	* 170
450	24	1 1/4	* 220	450	16	1 1/8	* 180
500	24	1 1/4	* 230	500	20	1 1/8	* 200
600	24	1 1/2	* 260	600	20	1 1/4	* 220

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.0M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.058.1		
GASKET, RF TANGED INSERT	1	85.30.01.004.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.053.1		
STUD BOLT WITH NUTS	4	81.38.66.153.1		
WELDING NECK FLANGE	1	76.62.78.352.1		

* DRAIN POINT		DN 20	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.062.1		
GASKET, RF TANGED INSERT	1	85.30.01.006.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.054.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.354.1		

* ORIFICE INSTR.CONN.		DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	4	85.30.01.004.1		
GATE VALVE FLANGED	2	77.20.04.003.1		
LAP-JOINT FLANGE	2	76.62.20.208.1		
STUD BOLT WITH NUTS	8	81.38.66.153.1		
	8	81.38.66.155.1		
WELDING NECK FLANGE	2	76.62.78.352.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	2	85.30.01.004.1		
GATE VALVE FLANGED	1	77.20.04.003.1		
LAP-JOINT FLANGE	1	76.62.20.208.1		
STUD BOLT WITH NUTS	4	81.38.66.153.1		
	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.352.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	2	85.30.01.004.1		
GATE VALVE FLANGED	1	77.20.04.003.1		
LAP-JOINT FLANGE	1	76.62.20.208.1		
STUD BOLT WITH NUTS	4	81.38.66.153.1		
	4	81.38.66.155.1		

* METERRUN INSTR. CONN		DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	4	85.30.01.004.1		
GATE VALVE FLANGED	2	77.20.04.003.1		
LAP-JOINT FLANGE	2	76.62.20.208.1		
STUD BOLT WITH NUTS	8	81.38.66.153.1		
	8	81.38.66.155.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1		
GASKET, RF TANGED INSERT	1	85.30.01.012.1		
STUD BOLT WITH NUTS	4	81.38.66.159.1		
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1		
GASKET, RF TANGED INSERT	1	85.30.01.012.1		
STUD BOLT WITH NUTS	4	81.38.66.159.1		
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1		

* VENT POINT		DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.058.1		
GASKET, RF TANGED INSERT	1	85.30.01.004.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.053.1		
STUD BOLT WITH NUTS	4	81.38.66.153.1		
WELDING NECK FLANGE	1	76.62.78.352.1		

* VENT POINT		DN 20	FIG.1M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.062.1		
GASKET, RF TANGED INSERT	1	85.30.01.006.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.054.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.354.1		

CLASS 11021

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
DN100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
DN200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING
- FOR AMMONIA, SODIUM, SODIUM-CARBONATE AND SODIUM-SULFHITE SERVICES, THROUGH-VISION LEVELGAUGES SHALL BE USED ONLY. PTFE-SHIELDS SHALL BE APPLIED.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
- USE SPIRAL WOUND GASKETS (CLASS 11300), IF GRAPHITE TANGED INSERT GASKETS ARE NOT ALLOWED DUE TO PRODUCT CONTAMINATION
- API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	D	D	D	D	D	D	D	A					50	40
300	C	C	C	C	E	E	E	E	E	E	A						80	40
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	20
100	C	C	C	C	D	D	A										250	20
80	C	C	C	C	D	A											300	20
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 11021	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)	74.13.14								211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	
PIPE (API 5L-B, SAW)	74.13.17																569.1
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE	76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE	76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1												
	77.10.20					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE SOCKET WELD	77.11.04	003.1	004.1	005.1	007.1												
GATE VALVE FLANGED	77.20.20								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED	77.30.05	003.1	004.1	005.1	007.1												
	77.30.20					008.1	010.1	012.1	014.1	015.1							
GLOBE VALVE SOCKET WELD	77.31.04	003.1	004.1	005.1	007.1												
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN	76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE	76.83.19					402.1	404.1	406.1	408.1	420.1	421.1	422.1	423.1	424.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.278.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.290.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.302.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.312.1	29.46.750.1	29.61.750.1	30.89.467.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.190.1	30.72.454.1	30.73.454.1	30.89.477.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.197.1	30.72.463.1	30.73.463.1	30.89.503.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.207.1	30.72.470.1	30.73.470.1	30.89.529.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.217.1	30.72.482.1	30.73.482.1	30.89.554.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.279.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.291.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.303.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.313.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.191.1	30.72.501.1	30.73.501.1	30.89.578.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.198.1	30.72.520.1	30.73.520.1	30.89.602.1
150* 50	79.00.814.1				450*300	79.00.208.1	30.72.550.1	30.73.550.1	30.89.626.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.218.1	30.72.581.1	30.73.581.1	30.89.650.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.228.1	30.72.611.1	30.73.611.1	30.89.674.1
200* 50	79.00.274.1				500* 50	79.00.280.1			
200* 80	79.00.286.1				500* 80	79.00.292.1			
200*100	79.00.298.1	30.72.322.1	30.73.322.1	30.89.210.1	500*100	79.00.304.1			
200*150	79.00.308.1	30.72.333.1	30.73.333.1	30.89.230.1	500*150	79.00.314.1			
250* 50	79.00.275.1				500*200	79.00.192.1	29.46.900.1	29.61.900.1	30.89.698.1
250* 80	79.00.287.1				500*250	79.00.199.1	30.72.633.1	30.73.633.1	30.89.722.1
250*100	79.00.299.1	29.46.340.1	29.61.340.1	30.89.258.1	500*300	79.00.209.1	30.72.640.1	30.73.640.1	30.89.746.1
250*150	79.00.309.1	30.72.353.1	30.73.353.1	30.89.276.1	500*350	79.00.219.1	30.72.671.1	30.73.671.1	30.89.770.1
250*200	79.00.187.1	30.72.361.1	30.73.361.1	30.89.289.1	500*400	79.00.229.1	30.72.701.1	30.73.701.1	30.89.794.1
300* 50	79.00.276.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.00.288.1				600* 50	79.00.282.1			
300*100	79.00.300.1				600* 80	79.00.294.1			
300*150	79.00.310.1	30.72.386.1	30.73.386.1	30.89.315.1	600*100	79.00.306.1			
300*200	79.00.188.1	30.72.392.1	30.73.392.1	30.89.326.1	600*150	79.00.316.1			
300*250	79.00.195.1	30.72.402.1	30.73.402.1	30.89.348.1	600*200	79.00.194.1			
350* 50	79.00.277.1				600*250	79.00.200.1	30.72.801.1	30.73.801.1	30.89.842.1
350* 80	79.00.289.1				600*300	79.00.210.1	30.72.821.1	30.73.821.1	30.89.866.1
350*100	79.00.301.1				600*350	79.00.220.1	30.72.841.1	30.73.841.1	30.89.890.1
350*150	79.00.311.1	29.46.600.1	29.61.600.1	30.89.377.1	600*400	79.00.230.1	30.72.881.1	30.73.881.1	30.89.914.1
350*200	79.00.189.1	30.72.423.1	30.73.423.1	30.89.388.1	600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*250	79.00.196.1	30.72.430.1	30.73.430.1	30.89.413.1	600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1
350*300	79.00.206.1	30.72.442.1	30.73.442.1	30.89.439.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	001.1	001.1
	200-600	002.1	002.1
20	40- 80	003.1	003.1
	100-600	004.1	004.1
25	40- 40	005.1	005.1
	50- 50	006.1	006.1
	80-100	007.1	007.1
	150-600	008.1	008.1
40	50- 50	010.1	009.1
	80- 80	011.1	010.1
	100-100	012.1	011.1
	150-300	013.1	013.1
	350-600	014.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.052.1	450	76.81.65.552.1
840	76.81.65.054.1	840	76.81.65.554.1
1230	76.81.65.056.1	1230	76.81.65.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.042.1	230	76.83.37.101.1
813	76.80.60.044.1	255	76.83.37.102.1
1219	76.80.60.046.1	305	76.83.37.103.1
1524	76.80.60.048.1	355	76.83.37.105.1
1829	76.80.60.050.1	405	76.83.37.106.1
2134	76.80.60.052.1	455	76.83.37.107.1
2438	76.80.60.054.1		
2743	76.80.60.056.1		
3048	76.80.60.058.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.354.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.05.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.354.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 11023

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
DN100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
DN200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL
BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND
DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	20	80
450	C	C	C	C	E	D	D	D	E	E	E	E	E	E	A		25	80
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A			40	80
350	C	C	C	C	D	D	D	D	D	D	D	D	A				50	40
300	C	C	C	C	D	D	D	D	D	D	D	A					80	40
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	20
100	C	C	C	C	D	D	A										250	20
80	C	C	C	C	D	A											300	20
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT	PLANT	:	
CLASS NO. : 11023		CONSIGNEE	:	
ANS RATING : CLASS 150		ENGINEERED BY :		
CORR. ALL. : 1 mm.		PRINCIPAL :		
REV. LETTER : B		CONTR.JOB NO. :		
REV. DATE : 12/98		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC TRIM: AISI 316 (L) ,PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.08	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE FLANGED		77.10.12	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.20.36								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.30.12	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.96					140.1	142.1	044.1	046.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1
STRAINER Y-TYPE		76.83.19					302.1	304.1	306.1	308.1	320.1	321.1	322.1	323.1	324.1			

BROB					RECB					REEB					TERB					BNIF					BNIP																																												
76.					76.					76.					76.					76.80.37					76.80.31																																												
RUN* BR																				BRANCH					RUN-PIPE																																												
20* 15					30.72.137.1					30.73.137.1					30.89.035.1					400* 50					79.00.278.1					15					40-150					001.1					001.1																								
25* 15					30.72.147.1					30.73.147.1					30.89.045.1					400* 80					79.00.290.1										200-600					002.1					002.1																								
25* 20					30.72.157.1					30.73.157.1					30.89.055.1					400*100					79.00.302.1					20					40- 80					003.1					003.1																								
40* 15					30.72.167.1					30.73.167.1					30.89.065.1					400*150					79.00.312.1					29.46.750.1					29.61.750.1					30.89.467.1					100-600					004.1					004.1														
40* 20					30.72.177.1					30.73.177.1					30.89.075.1					400*200					79.00.190.1					30.72.454.1					30.73.454.1					30.89.477.1					25					40- 40					005.1					005.1									
40* 25					30.72.187.1					30.73.187.1					30.89.085.1					400*250					79.00.197.1					30.72.463.1					30.73.463.1					30.89.503.1										50- 50					006.1					006.1									
50* 20					29.46.192.1					29.61.192.1					30.89.100.1					400*300					79.00.207.1					30.72.470.1					30.73.470.1					30.89.529.1										80-100					007.1					007.1									
50* 25					30.72.196.1					30.73.196.1					30.89.109.1					400*350					79.00.217.1					30.72.482.1					30.73.482.1					30.89.554.1										150-600					008.1					008.1									
50* 40					30.72.206.1					30.73.206.1					30.89.118.1					450* 50					79.00.279.1																				40					50- 50					010.1					009.1									
80* 40					30.72.226.1					30.73.226.1					30.89.127.1					450* 80					79.00.291.1																														80- 80					011.1					010.1				
80* 50					79.00.810.1					30.72.235.1					30.73.235.1					30.89.132.1					450*100					79.00.303.1																									100-100					012.1					011.1				
100* 40										30.72.250.1					30.73.250.1					30.89.145.1					450*150					79.00.313.1																									150-300					013.1					013.1				
100* 50					79.00.812.1					30.72.265.1					30.73.265.1					30.89.153.1					450*200					79.00.191.1					30.72.501.1					30.73.501.1					30.89.578.1										350-600					014.1					014.1				
100* 80					79.00.836.1					30.72.275.1					30.73.275.1					30.89.165.1					450*250					79.00.198.1					30.72.520.1					30.73.520.1					30.89.602.1																								
150* 50					79.00.814.1															450*300					79.00.208.1					30.72.550.1					30.73.550.1					30.89.626.1																													
150* 80					79.00.838.1					30.72.295.1					30.73.295.1					30.89.177.1					450*350					79.00.218.1					30.72.581.1					30.73.581.1					30.89.650.1																								
150*100					79.00.860.1					30.72.305.1					30.73.305.1					30.89.189.1					450*400					79.00.228.1					30.72.611.1					30.73.611.1					30.89.674.1																								
200* 50					79.00.274.1															500* 50					79.00.280.1																																												
200* 80					79.00.286.1															500* 80					79.00.292.1																																												
200*100					79.00.298.1					30.72.322.1					30.73.322.1					30.89.210.1					500*100					79.00.304.1																																							
200*150					79.00.308.1					30.72.333.1					30.73.333.1					30.89.230.1					500*150					79.00.314.1																																							
250* 50					79.00.275.1															500*200					79.00.192.1					29.46.900.1					29.61.900.1					30.89.698.1					LEVEL					DISPLACER					CHAMBER					THERMOW									
250* 80					79.00.287.1															500*250					79.00.199.1					30.72.633.1					30.73.633.1					30.89.722.1					LENGTH					MESCNUMBER					LENGTH														
250*100					79.00.299.1					29.46.340.1					29.61.340.1					30.89.258.1					500*300					79.00.209.1					30.72.640.1					30.73.640.1					30.89.746.1					-----					-----					-----									
250*150					79.00.309.1					30.72.353.1					30.73.353.1					30.89.276.1					500*350					79.00.219.1					30.72.671.1					30.73.671.1					30.89.770.1					356					76.80.59.042.1					230									
250*200					79.00.187.1					30.72.361.1					30.73.361.1					30.89.289.1					500*400					79.00.229.1					30.72.701.1					30.73.701.1					30.89.794.1					813					76.80.59.044.1					255									
300* 50					79.00.276.1															500*450					79.00.250.1					30.72.731.1					30.73.731.1					30.89.818.1					1219					76.80.59.046.1					305														
300* 80					79.00.288.1															600* 50					79.00.282.1																				1524					76.80.59.048.1					355														
300*100					79.00.300.1															600* 80					79.00.294.1																				1829					76.80.59.050.1					405														
300*150					79.00.310.1					30.72.386.1					30.73.386.1					30.89.315.1					600*100					79.00.306.1															2134					76.80.59.052.1					455														
300*200					79.00.188.1					30.72.392.1					30.73.392.1					30.89.326.1					600*150					79.00.316.1															2438					76.80.59.054.1																			
300*250					79.00.195.1					30.72.402.1					30.73.402.1					30.89.348.1					600*200					79.00.194.1															2743					76.80.59.056.1																			
350* 50					79.00.277.1															600*250					79.00.200.1					30.72.801.1					30.73.801.1					30.89.842.1					3048					76.80.59.058.1																			
350* 80					79.00.289.1															600*300					79.00.210.1					30.72.821.1					30.73.821.1					30.89.866.1																													
350*100					79.00.301.1															600*350					79.00.220.1					30.72.841.1					30.73.841.1					30.89.890.1																													
350*150					79.00.311.1					29.46.600.1					29.61.600.1					30.89.377.1					600*400					79.00.230.1					30.72.881.1					30.73.881.1					30.89.914.1																								
350*200					79.00.189.1					30.72.423.1					30.73.423.1					30.89.388.1					600*450					79.00.254.1					30.72.911.1					30.73.911.1					30.89.938.1																								
350*250					79.00.196.1					30.72.430.1					30.73.430.1					30.89.413.1					600*500					79.00.260.1					30.72.941.1					30.73.941.1					30.89.962.1																								
350*300					79.00.206.1					30.72.442.1					30.73.442.1					30.89.439.1																																																	

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.354.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.12.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.12.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.354.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.12.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 11025

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	75	100	125	150	175	200	210
	PRESSURE BAR GA								
DN15 -600	19.6	19.2	18.4	17.7	16.7	15.8	12.0	7.0	4.7

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING AND API609 CAT.B BUTTERFLY VALVE RATING
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A	25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A		40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A			50	80
300	C	C	C	C	E	E	E	E	E	E	E	A				80	80
250	C	C	C	C	D	D	D	D	D	A						100	40
200	C	C	C	C	D	D	D	D	D	A						150	40
150	C	C	C	C	D	D	D	D	A							200	30
100	C	C	C	C	D	D	A									250	30
80	C	C	C	C	D	A										300	30
50	C	C	C	B	A											350	20
40	C	B	B	A												400	20
25	B	B	A													450	20
20	B	A														500	20
15	A															600	20

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT SOUR	PLANT	:	
CLASS NO. : 11025		CONSIGNEE	:	
ANS RATING : CLASS 150		ENGINEERED BY :		
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : B		CONTR.JOB NO. :		
REV. DATE : 12/98		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 11025, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC TRIM: AISI 316 (L), PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC TRIM: AISI 316 (L), PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L)
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L), STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L), STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
ST3B	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWGS	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	020.1	030.1	040.1	060.1	071.1	109.1	149.1	211.1	241.1	283.1	325.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE	50MM	76.30.54	036.1	046.1	056.1	076.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.37	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	402.1	404.1	406.1	408.1	360.1	362.1	314.1	316.1	258.1	260.1	262.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
BALL VALVE FULL BORE FLANGED		77.00.08	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1								
BALL VALVE RED. BORE FLANGED		77.00.08	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1								
BUTTERFLY VALVE WAFER TYPE		77.57.54								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED		77.10.12	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.30.12	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.96					190.1	192.1	044.1	046.1	020.1	022.1	024.1	010.1	012.1	014.1	016.1	018.1
STRAINER Y-TYPE		76.83.22					326.1	328.1	343.1	344.1	345.1	346.1	347.1	348.1	349.1			

RUN* BR	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.	.	76.	76.	76.	76.
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.01.748.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.01.760.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.00.302.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.00.312.1	29.47.750.1	29.62.750.1	30.88.467.1
40* 20		30.66.181.1	30.67.181.1		400*250	79.00.115.1			
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*300	79.00.121.1			
50* 20		30.66.193.1	30.67.193.1	30.88.102.1	400*350	79.00.217.1	30.66.482.1	30.67.482.1	30.88.554.1
50* 25		30.66.199.1	30.67.199.1	30.88.111.1	450* 50	79.01.749.1			
50* 40		30.66.208.1	30.67.208.1	30.88.120.1	450* 80	79.01.761.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450*100	79.00.303.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*150	79.00.313.1			
100* 50	79.01.062.1				450*200	79.00.109.1	30.66.509.1	30.67.509.1	30.88.586.1
100* 80	79.01.086.1				450*250	79.00.116.1	30.66.532.1	30.67.532.1	30.88.610.1
150* 50	79.01.064.1				450*300	79.00.122.1	30.66.562.1	30.67.562.1	30.88.634.1
150* 80	79.01.088.1				450*350	79.00.218.1	30.66.581.1	30.67.581.1	30.88.650.1
150*100	79.00.860.1	30.66.305.1	30.67.305.1	30.88.189.1	450*400	79.00.228.1	30.66.611.1	30.67.611.1	30.88.674.1
200* 50	79.01.263.1				500* 50	79.01.750.1			
200* 80	79.01.275.1				500* 80	79.01.762.1			
200*100	79.00.390.1	30.66.324.1	30.67.324.1	30.88.211.1	500*100	79.00.304.1			
200*150	79.00.400.1	30.66.334.1	30.67.334.1	30.88.231.1	500*150	79.00.314.1			
250* 50	79.01.264.1				500*200	79.00.110.1	29.47.909.1	29.62.909.1	30.88.706.1
250* 80	79.01.276.1				500*250	79.00.117.1	30.66.639.1	30.67.639.1	30.88.730.1
250*100	79.00.391.1	29.47.342.1	29.62.342.1	30.88.259.1	500*300	79.00.123.1	30.66.652.1	30.67.652.1	30.88.754.1
250*150	79.00.401.1	30.66.352.1	30.67.352.1	30.88.277.1	500*350	79.00.219.1	30.66.671.1	30.67.671.1	30.88.770.1
250*200	79.00.458.1	30.66.363.1	30.67.363.1	30.88.290.1	500*400	79.00.229.1	30.66.701.1	30.67.701.1	30.88.794.1
300* 50	79.01.265.1				500*450	79.00.250.1	30.66.731.1	30.67.731.1	30.88.818.1
300* 80	79.01.277.1				600* 50	79.01.751.1			
300*100	79.00.392.1				600* 80	79.01.763.1			
300*150	79.00.402.1	30.66.381.1	30.67.381.1	30.88.316.1	600*100	79.00.306.1			
300*200	79.00.460.1	30.66.394.1	30.67.394.1	30.88.327.1	600*150	79.00.316.1			
300*250	79.00.476.1	30.66.403.1	30.67.403.1	30.88.349.1	600*200	79.00.111.1			
350* 50	79.01.747.1				600*250	79.00.118.1	30.66.809.1	30.67.809.1	30.88.850.1
350* 80	79.01.759.1				600*300	79.00.124.1	30.66.829.1	30.67.829.1	30.88.874.1
350*100	79.00.301.1				600*350	79.00.220.1	30.66.841.1	30.67.841.1	30.88.890.1
350*150	79.00.311.1	29.47.600.1	29.62.600.1	30.88.377.1	600*400	79.00.230.1	30.66.881.1	30.67.881.1	30.88.914.1
350*250	79.00.114.1				600*450	79.00.254.1	30.66.911.1	30.67.911.1	30.88.938.1
350*300	79.00.120.1				600*500	79.00.260.1	30.66.941.1	30.67.941.1	30.88.962.1

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.37	76.80.31
15	40-600	021.1	016.1
20	40-600	023.1	018.1
25	40-100	025.1	020.1
	150-600	026.1	024.1
40	50-100	030.1	026.1
	150-600	031.1	028.1

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET API609 BFLY VALVE

BOLTSET FLANGED JOINTS

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	

					15	4	1/2	* 60	66.153.1
					20	4	1/2	* 70	66.155.1
					25	4	1/2	* 70	66.155.1
					40	4	1/2	* 80	66.157.1
					50	4	5/8	* 80	66.269.1
80	4	5/8	* 90	66.271.1	80	4	5/8	* 100	66.273.1
100	8	5/8	* 100	66.273.1	100	8	5/8	* 100	66.273.1
150	8	3/4	* 110	66.330.1	150	8	3/4	* 100	66.329.1
200	8	3/4	* 110	66.330.1	200	8	3/4	* 110	66.330.1
250	12	7/8	* 130	66.403.1	250	12	7/8	* 120	66.401.1
300	12	7/8	* 140	66.404.1	300	12	7/8	* 120	66.401.1
350	12	1	* 150	66.471.1	350	12	1	* 130	66.468.1
400	16	1	* 160	66.472.1	400	16	1	* 140	66.469.1
450	16	1 1/8	* 180	66.533.1	450	16	1 1/8	* 150	66.529.1
500	20	1 1/8	* 190	66.535.1	500	20	1 1/8	* 160	66.530.1
600	20	1 1/4	* 230	66.598.1	600	20	1 1/4	* 180	66.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	

15	4	1/2	* 70	66.155.1					
20	4	1/2	* 70	66.155.1					
25	4	1/2	* 80	66.157.1					
40	4	1/2	* 80	66.157.1					
					50	8	5/8	* 150	66.281.1
					80	8	3/4	* 150	66.337.1
					100	12	3/4	* 140	66.335.1
					150	12	3/4	* 140	66.335.1
					200	12	7/8	* 150	66.406.1
					250	16	1	* 170	66.474.1
					300	16	1 1/8	* 190	66.535.1
					350	20	1 1/8	* 200	66.525.1
					400	20	1 1/4	* 210	66.595.1
					450	24	1 1/4	* 220	66.597.1
					500	24	1 1/4	* 230	66.598.1
					600	24	1 1/2	* 260	66.690.1

BOLTSET SPECTACLE/SPACER

81.38				
DN	NR	INCH	* MM	

15	4	1/2	* 70	66.155.1
20	4	1/2	* 70	66.155.1
25	4	1/2	* 80	66.157.1
40	4	1/2	* 80	66.157.1
50	4	5/8	* 90	66.271.1
80	4	5/8	* 110	66.274.1
100	8	5/8	* 110	66.274.1
150	8	3/4	* 120	66.332.1
200	8	3/4	* 130	66.334.1
250	12	7/8	* 140	66.404.1
300	12	7/8	* 150	66.406.1
350	12	1	* 160	66.472.1
400	16	1	* 170	66.474.1
450	16	1 1/8	* 180	66.533.1
500	20	1 1/8	* 200	66.525.1
600	20	1 1/4	* 220	66.597.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
	8	81.38.66.155.1	
WELDING NECK FLANGE	2	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.66.153.1	
	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.66.153.1	
	4	81.38.66.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
	8	81.38.66.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.66.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.66.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.12.003.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.12.004.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.12.004.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	

CLASS 11031

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 160
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	D	D	D	D	D	D	D	A					100 40
200	C	C	C	C	D	D	D	D	D	A							150 40
150	C	C	C	C	D	D	D	D	D	A							200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 20
40	C	B	B	A													400 20
25	B	B	A														450 20
20	B	A															500 20
15	A																600 20

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 11031	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
ST3B	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	149.1	211.1	241.1	283.1	325.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE	50MM	76.30.57	436.1	446.1	456.1	476.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	402.1	404.1	406.1	408.1	360.1	362.1	314.1	316.1	258.1	260.1	262.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	095.1	115.1	133.1	153.1	173.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.20.04	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.30.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	564.1	566.1	508.1	510.1	512.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.19					426.1	428.1	443.1	444.1	445.1	446.1	447.1	448.1	449.1			

RUN* BR	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.	.	76.	76.	76.	76.
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.748.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.760.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.00.302.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.00.312.1	29.46.750.1	29.61.750.1	30.89.467.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*250	79.00.115.1			
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*300	79.00.121.1			
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*350	79.00.217.1	30.72.482.1	30.73.482.1	30.89.554.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	450* 50	79.01.749.1			
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 80	79.01.761.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450*100	79.00.303.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*150	79.00.313.1			
100* 50	79.01.062.1				450*200	79.00.109.1	30.72.509.1	30.73.509.1	
100* 80	79.01.086.1				450*250	79.00.116.1	30.72.532.1	30.73.532.1	
150* 50	79.01.064.1				450*300	79.00.122.1	30.72.562.1	30.73.562.1	
150* 80	79.01.088.1				450*350	79.00.218.1	30.72.581.1	30.73.581.1	30.89.650.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.228.1	30.72.611.1	30.73.611.1	30.89.674.1
200* 50	79.01.263.1				500* 50	79.01.750.1			
200* 80	79.01.275.1				500* 80	79.01.762.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.304.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.314.1			
250* 50	79.01.264.1				500*200	79.00.110.1	29.46.909.1	29.61.909.1	
250* 80	79.01.276.1				500*250	79.00.117.1	30.72.639.1	30.73.639.1	
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.123.1	30.72.652.1	30.73.652.1	
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.219.1	30.72.671.1	30.73.671.1	30.89.770.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.229.1	30.72.701.1	30.73.701.1	30.89.794.1
300* 50	79.01.265.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.01.277.1				600* 50	79.01.751.1			
300*100	79.00.392.1				600* 80	79.01.763.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.306.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.316.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.111.1			
350* 50	79.01.747.1				600*250	79.00.118.1	30.72.809.1	30.73.809.1	
350* 80	79.01.759.1				600*300	79.00.124.1	30.72.829.1	30.73.829.1	
350*100	79.00.301.1				600*350	79.00.220.1	30.72.841.1	30.73.841.1	30.89.890.1
350*150	79.00.311.1	29.46.600.1	29.61.600.1	30.89.377.1	600*400	79.00.230.1	30.72.881.1	30.73.881.1	30.89.914.1
350*250	79.00.114.1				600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*300	79.00.120.1				600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.37	76.80.31
15	40-600	021.1	016.1
20	40-600	023.1	018.1
25	40-100	025.1	020.1
	150-600	026.1	024.1
40	50-100	030.1	026.1
	150-600	031.1	028.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
450	76.81.65.052.1	450	76.81.65.552.1
840	76.81.65.054.1	840	76.81.65.554.1
1230	76.81.65.056.1	1230	76.81.65.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.60.042.1	230	76.83.37.101.1
813	76.80.60.044.1	255	76.83.37.102.1
1219	76.80.60.046.1	305	76.83.37.103.1
1524	76.80.60.048.1	355	76.83.37.105.1
1829	76.80.60.050.1	405	76.83.37.106.1
2134	76.80.60.052.1	455	76.83.37.107.1
2438	76.80.60.054.1		
2743	76.80.60.056.1		
3048	76.80.60.058.1		

COMP. NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* DRAIN POINT	DN 20	FIG.0I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.04.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.04.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.05.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 11041

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A	20 80	
450	C	C	C	C	E	D	D	D	E	E	E	E	E	A		25 80	
400	C	C	C	C	D	D	D	D	D	D	D	D	A			40 80	
350	C	C	C	C	D	D	D	D	D	D	D	A				50 40	
300	C	C	C	C	D	D	D	D	D	D	A					80 40	
250	C	C	C	C	D	D	D	D	D	A						100 40	
200	C	C	C	C	D	D	D	D	A							150 40	
150	C	C	C	C	D	D	D	A								200 20	
100	C	C	C	C	D	D	A									250 20	
80	C	C	C	C	D	A										300 20	
50	C	C	C	B	A											350 20	
40	C	B	B	A												400 20	
25	B	B	A													450 20	
20	B	A														500 20	
15	A															600 20	

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 11041	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : 0	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE	76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE	76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED	77.20.04	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED	77.30.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN	76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE	76.83.19					402.1	404.1	406.1	408.1	420.1	421.1	422.1	423.1	424.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.278.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.290.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.302.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.312.1	29.46.750.1	29.61.750.1	30.89.467.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.190.1	30.72.454.1	30.73.454.1	30.89.477.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.197.1	30.72.463.1	30.73.463.1	30.89.503.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.207.1	30.72.470.1	30.73.470.1	30.89.529.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.217.1	30.72.482.1	30.73.482.1	30.89.554.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.279.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.291.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.303.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.313.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.191.1	30.72.501.1	30.73.501.1	30.89.578.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.198.1	30.72.520.1	30.73.520.1	30.89.602.1
150* 50	79.00.814.1				450*300	79.00.208.1	30.72.550.1	30.73.550.1	30.89.626.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.218.1	30.72.581.1	30.73.581.1	30.89.650.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.228.1	30.72.611.1	30.73.611.1	30.89.674.1
200* 50	79.00.274.1				500* 50	79.00.280.1			
200* 80	79.00.286.1				500* 80	79.00.292.1			
200*100	79.00.298.1	30.72.322.1	30.73.322.1	30.89.210.1	500*100	79.00.304.1			
200*150	79.00.308.1	30.72.333.1	30.73.333.1	30.89.230.1	500*150	79.00.314.1			
250* 50	79.00.275.1				500*200	79.00.192.1	29.46.900.1	29.61.900.1	30.89.698.1
250* 80	79.00.287.1				500*250	79.00.199.1	30.72.633.1	30.73.633.1	30.89.722.1
250*100	79.00.299.1	29.46.340.1	29.61.340.1	30.89.258.1	500*300	79.00.209.1	30.72.640.1	30.73.640.1	30.89.746.1
250*150	79.00.309.1	30.72.353.1	30.73.353.1	30.89.276.1	500*350	79.00.219.1	30.72.671.1	30.73.671.1	30.89.770.1
250*200	79.00.187.1	30.72.361.1	30.73.361.1	30.89.289.1	500*400	79.00.229.1	30.72.701.1	30.73.701.1	30.89.794.1
300* 50	79.00.276.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.00.288.1				600* 50	79.00.282.1			
300*100	79.00.300.1				600* 80	79.00.294.1			
300*150	79.00.310.1	30.72.386.1	30.73.386.1	30.89.315.1	600*100	79.00.306.1			
300*200	79.00.188.1	30.72.392.1	30.73.392.1	30.89.326.1	600*150	79.00.316.1			
300*250	79.00.195.1	30.72.402.1	30.73.402.1	30.89.348.1	600*200	79.00.194.1			
350* 50	79.00.277.1				600*250	79.00.200.1	30.72.801.1	30.73.801.1	30.89.842.1
350* 80	79.00.289.1				600*300	79.00.210.1	30.72.821.1	30.73.821.1	30.89.866.1
350*100	79.00.301.1				600*350	79.00.220.1	30.72.841.1	30.73.841.1	30.89.890.1
350*150	79.00.311.1	29.46.600.1	29.61.600.1	30.89.377.1	600*400	79.00.230.1	30.72.881.1	30.73.881.1	30.89.914.1
350*200	79.00.189.1	30.72.423.1	30.73.423.1	30.89.388.1	600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*250	79.00.196.1	30.72.430.1	30.73.430.1	30.89.413.1	600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1
350*300	79.00.206.1	30.72.442.1	30.73.442.1	30.89.439.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	001.1	001.1
	200-600	002.1	002.1
20	40- 80	003.1	003.1
	100-600	004.1	004.1
25	40- 40	005.1	005.1
	50- 50	006.1	006.1
	80-100	007.1	007.1
	150-600	008.1	008.1
40	50- 50	010.1	009.1
	80- 80	011.1	010.1
	100-100	012.1	011.1
	150-300	013.1	013.1
	350-600	014.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.052.1	450	76.81.65.552.1
840	76.81.65.054.1	840	76.81.65.554.1
1230	76.81.65.056.1	1230	76.81.65.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.042.1	230	76.83.37.101.1
813	76.80.60.044.1	255	76.83.37.102.1
1219	76.80.60.046.1	305	76.83.37.103.1
1524	76.80.60.048.1	355	76.83.37.105.1
1829	76.80.60.050.1	405	76.83.37.106.1
2134	76.80.60.052.1	455	76.83.37.107.1
2438	76.80.60.054.1		
2743	76.80.60.056.1		
3048	76.80.60.058.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.04.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.354.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.04.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.05.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.354.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 11042

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400
-----	-----								
	PRESSURE BAR GA								
DN15 -600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

NOTES

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- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 160
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	D	D	D	D	D	D	A						100 40
200	C	C	C	C	D	D	D	D	D	A							150 40
150	C	C	C	C	D	D	D	D	A								200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 20
40	C	B	B	A													400 20
25	B	B	A														450 20
20	B	A															500 20
15	A																600 20

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 11042	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 11042, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
ST3B	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	149.1	211.1	241.1	283.1	325.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE	50MM	76.30.57	436.1	446.1	456.1	476.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	402.1	404.1	406.1	408.1	360.1	362.1	314.1	316.1	258.1	260.1	262.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	095.1	115.1	133.1	153.1	173.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.20.04	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.30.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	564.1	566.1	508.1	510.1	512.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.19					426.1	428.1	443.1	444.1	445.1	446.1	447.1	448.1	449.1			

RUN* BR	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.	.	76.	76.	76.	76.
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.748.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.760.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.00.302.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.00.312.1	29.46.750.1	29.61.750.1	30.89.467.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*250	79.00.115.1			
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*300	79.00.121.1			
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*350	79.00.217.1	30.72.482.1	30.73.482.1	30.89.554.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	450* 50	79.01.749.1			
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 80	79.01.761.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450*100	79.00.303.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*150	79.00.313.1			
100* 50	79.01.062.1				450*200	79.00.109.1	30.72.509.1	30.73.509.1	
100* 80	79.01.086.1				450*250	79.00.116.1	30.72.532.1	30.73.532.1	
150* 50	79.01.064.1				450*300	79.00.122.1	30.72.562.1	30.73.562.1	
150* 80	79.01.088.1				450*350	79.00.218.1	30.72.581.1	30.73.581.1	30.89.650.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.228.1	30.72.611.1	30.73.611.1	30.89.674.1
200* 50	79.01.263.1				500* 50	79.01.750.1			
200* 80	79.01.275.1				500* 80	79.01.762.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.304.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.314.1			
250* 50	79.01.264.1				500*200	79.00.110.1	29.46.909.1	29.61.909.1	
250* 80	79.01.276.1				500*250	79.00.117.1	30.72.639.1	30.73.639.1	
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.123.1	30.72.652.1	30.73.652.1	
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.219.1	30.72.671.1	30.73.671.1	30.89.770.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.229.1	30.72.701.1	30.73.701.1	30.89.794.1
300* 50	79.01.265.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.01.277.1				600* 50	79.01.751.1			
300*100	79.00.392.1				600* 80	79.01.763.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.306.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.316.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.111.1			
350* 50	79.01.747.1				600*250	79.00.118.1	30.72.809.1	30.73.809.1	
350* 80	79.01.759.1				600*300	79.00.124.1	30.72.829.1	30.73.829.1	
350*100	79.00.301.1				600*350	79.00.220.1	30.72.841.1	30.73.841.1	30.89.890.1
350*150	79.00.311.1	29.46.600.1	29.61.600.1	30.89.377.1	600*400	79.00.230.1	30.72.881.1	30.73.881.1	30.89.914.1
350*250	79.00.114.1				600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*300	79.00.120.1				600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.37	76.80.31
15	40-600	021.1	016.1
20	40-600	023.1	018.1
25	40-100	025.1	020.1
	150-600	026.1	024.1
40	50-100	030.1	026.1
	150-600	031.1	028.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
450	76.81.65.052.1	450	76.81.65.552.1
840	76.81.65.054.1	840	76.81.65.554.1
1230	76.81.65.056.1	1230	76.81.65.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.60.042.1	230	76.83.37.101.1
813	76.80.60.044.1	255	76.83.37.102.1
1219	76.80.60.046.1	305	76.83.37.103.1
1524	76.80.60.048.1	355	76.83.37.105.1
1829	76.80.60.050.1	405	76.83.37.106.1
2134	76.80.60.052.1	455	76.83.37.107.1
2438	76.80.60.054.1		
2743	76.80.60.056.1		
3048	76.80.60.058.1		

COMP. NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* DRAIN POINT	DN 20	FIG.0I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.04.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.04.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.05.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 11055

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 160
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	D	D	D	D	D	D	A						100 40
200	C	C	C	C	D	D	D	D	D	A							150 40
150	C	C	C	C	D	D	D	D	A								200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 20
40	C	B	B	A													400 20
25	B	B	A														450 20
20	B	A															500 20
15	A																600 20

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 11055		CONSIGNEE	:	
ANS RATING : CLASS 150		ENGINEERED BY	:	
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO.	:	
REV. DATE : 12/96		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
ST3B	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	020.1	030.1	040.1	060.1	071.1	109.1	149.1	211.1	241.1	283.1	325.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM		76.30.54	036.1	046.1	056.1	076.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.37	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	402.1	404.1	406.1	408.1	360.1	362.1	314.1	316.1	258.1	260.1	262.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.11.14	233.1	234.1	235.1	237.1												
CHECK VALVE FLANGED		77.10.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE BUTT-WELD ENDS		77.21.14	103.1	104.1	105.1	107.1												
GATE VALVE FLANGED		77.20.04	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	103.1	104.1	105.1	107.1												
GLOBE VALVE FLANGED		77.30.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	564.1	566.1	508.1	510.1	512.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.22					026.1	028.1	043.1	044.1	045.1	046.1	047.1	048.1	049.1			

RUN* BR	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.	.	76.	76.	76.	76.
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.01.748.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.01.760.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.00.302.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.00.312.1	29.47.750.1	29.62.750.1	30.88.467.1
40* 20		30.66.181.1	30.67.181.1		400*250	79.00.115.1			
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*300	79.00.121.1			
50* 20		30.66.193.1	30.67.193.1	30.88.102.1	400*350	79.00.217.1	30.66.482.1	30.67.482.1	30.88.554.1
50* 25		30.66.199.1	30.67.199.1	30.88.111.1	450* 50	79.01.749.1			
50* 40		30.66.208.1	30.67.208.1	30.88.120.1	450* 80	79.01.761.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450*100	79.00.303.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*150	79.00.313.1			
100* 50	79.01.062.1				450*200	79.00.109.1	30.66.509.1	30.67.509.1	30.88.586.1
100* 80	79.01.086.1				450*250	79.00.116.1	30.66.532.1	30.67.532.1	30.88.610.1
150* 50	79.01.064.1				450*300	79.00.122.1	30.66.562.1	30.67.562.1	30.88.634.1
150* 80	79.01.088.1				450*350	79.00.218.1	30.66.581.1	30.67.581.1	30.88.650.1
150*100	79.00.860.1	30.66.305.1	30.67.305.1	30.88.189.1	450*400	79.00.228.1	30.66.611.1	30.67.611.1	30.88.674.1
200* 50	79.01.263.1				500* 50	79.01.750.1			
200* 80	79.01.275.1				500* 80	79.01.762.1			
200*100	79.00.390.1	30.66.324.1	30.67.324.1	30.88.211.1	500*100	79.00.304.1			
200*150	79.00.400.1	30.66.334.1	30.67.334.1	30.88.231.1	500*150	79.00.314.1			
250* 50	79.01.264.1				500*200	79.00.110.1	29.47.909.1	29.62.909.1	30.88.706.1
250* 80	79.01.276.1				500*250	79.00.117.1	30.66.639.1	30.67.639.1	30.88.730.1
250*100	79.00.391.1	29.47.342.1	29.62.342.1	30.88.259.1	500*300	79.00.123.1	30.66.652.1	30.67.652.1	30.88.754.1
250*150	79.00.401.1	30.66.352.1	30.67.352.1	30.88.277.1	500*350	79.00.219.1	30.66.671.1	30.67.671.1	30.88.770.1
250*200	79.00.458.1	30.66.363.1	30.67.363.1	30.88.290.1	500*400	79.00.229.1	30.66.701.1	30.67.701.1	30.88.794.1
300* 50	79.01.265.1				500*450	79.00.250.1	30.66.731.1	30.67.731.1	30.88.818.1
300* 80	79.01.277.1				600* 50	79.01.751.1			
300*100	79.00.392.1				600* 80	79.01.763.1			
300*150	79.00.402.1	30.66.381.1	30.67.381.1	30.88.316.1	600*100	79.00.306.1			
300*200	79.00.460.1	30.66.394.1	30.67.394.1	30.88.327.1	600*150	79.00.316.1			
300*250	79.00.476.1	30.66.403.1	30.67.403.1	30.88.349.1	600*200	79.00.111.1			
350* 50	79.01.747.1				600*250	79.00.118.1	30.66.809.1	30.67.809.1	30.88.850.1
350* 80	79.01.759.1				600*300	79.00.124.1	30.66.829.1	30.67.829.1	30.88.874.1
350*100	79.00.301.1				600*350	79.00.220.1	30.66.841.1	30.67.841.1	30.88.890.1
350*150	79.00.311.1	29.47.600.1	29.62.600.1	30.88.377.1	600*400	79.00.230.1	30.66.881.1	30.67.881.1	30.88.914.1
350*250	79.00.114.1				600*450	79.00.254.1	30.66.911.1	30.67.911.1	30.88.938.1
350*300	79.00.120.1				600*500	79.00.260.1	30.66.941.1	30.67.941.1	30.88.962.1

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.37	76.80.31
15	40-600	021.1	016.1
20	40-600	023.1	018.1
25	40-100	025.1	020.1
	150-600	026.1	024.1
40	50-100	030.1	026.1
	150-600	031.1	028.1

LEVEL	DISPLACER	CHAMBER	THERMOWELL	
LENGTH	MESCNBER		LENGTH	MESCNBER
-----	-----		-----	-----
356	76.80.60.402.1		230	76.83.37.101.1
813	76.80.60.404.1		255	76.83.37.102.1
1219	76.80.60.406.1		305	76.83.37.103.1
1524	76.80.60.408.1		355	76.83.37.105.1
1829	76.80.60.410.1		405	76.83.37.106.1
2134	76.80.60.412.1		455	76.83.37.107.1
2438	76.80.60.414.1			
2743	76.80.60.416.1			
3048	76.80.60.418.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 60	15	4	1/2	* 70
20	4	1/2	* 70	20	4	1/2	* 70
25	4	1/2	* 70	25	4	1/2	* 80
40	4	1/2	* 80	40	4	1/2	* 80
50	4	5/8	* 80				
80	4	5/8	* 100				
100	8	5/8	* 100				
150	8	3/4	* 100				
200	8	3/4	* 110				
250	12	7/8	* 120				
300	12	7/8	* 120				
350	12	1	* 130				
400	16	1	* 140				
450	16	1 1/8	* 150				
500	20	1 1/8	* 160				
600	20	1 1/4	* 180				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 70
				20	4	1/2	* 70
				25	4	1/2	* 80
				40	4	1/2	* 80
50	8	5/8	* 150	50	4	5/8	* 90
80	8	3/4	* 150	80	4	5/8	* 110
100	12	3/4	* 140	100	8	5/8	* 110
150	12	3/4	* 140	150	8	3/4	* 120
200	12	7/8	* 150	200	8	3/4	* 130
250	16	1	* 170	250	12	7/8	* 140
300	16	1 1/8	* 190	300	12	7/8	* 150
350	20	1 1/8	* 200	350	12	1	* 160
400	20	1 1/4	* 210	400	16	1	* 170
450	24	1 1/4	* 220	450	16	1 1/8	* 180
500	24	1 1/4	* 230	500	20	1 1/8	* 200
600	24	1 1/2	* 260	600	20	1 1/4	* 220

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.0M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.058.1		
GASKET, RF TANGED INSERT	1	85.30.01.004.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1		
STUD BOLT WITH NUTS	4	81.38.66.153.1		
WELDING NECK FLANGE	1	76.62.78.402.1		

* DRAIN POINT		DN 20	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.062.1		
GASKET, RF TANGED INSERT	1	85.30.01.006.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.104.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.404.1		

* ORIFICE INSTR.CONN.		DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	2	85.30.01.004.1		
GATE VALVE BUTT-WELD ENDS	2	77.21.14.103.1		
LAP-JOINT FLANGE	2	76.62.20.208.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	2	76.62.78.402.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	1	85.30.01.004.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1		
LAP-JOINT FLANGE	1	76.62.20.208.1		
PIPE NIPPLE 50MM	1	76.30.54.036.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.402.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	1	85.30.01.004.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1		
LAP-JOINT FLANGE	1	76.62.20.208.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.402.1		

* METERRUN INSTR. CONN		DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	4	85.30.01.004.1		
GATE VALVE FLANGED	2	77.20.04.003.1		
LAP-JOINT FLANGE	2	76.62.20.208.1		
STUD BOLT WITH NUTS	8	81.38.66.153.1		
	8	81.38.66.155.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1		
GASKET, RF TANGED INSERT	1	85.30.01.012.1		
STUD BOLT WITH NUTS	4	81.38.66.159.1		
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1		
GASKET, RF TANGED INSERT	1	85.30.01.012.1		
STUD BOLT WITH NUTS	4	81.38.66.159.1		
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1		

* VENT POINT		DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.058.1		
GASKET, RF TANGED INSERT	1	85.30.01.004.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.103.1		
STUD BOLT WITH NUTS	4	81.38.66.153.1		
WELDING NECK FLANGE	1	76.62.78.402.1		

* VENT POINT		DN 20	FIG.1M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.062.1		
GASKET, RF TANGED INSERT	1	85.30.01.006.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.104.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.404.1		

CLASS 11091

DESIGN LIMITS				
TEMPERATURE IN DEGREES CELSIUS				
	0	50	65	

PRESSURE BAR GA				
DN25 -300	19.6	19.2	18.8	
NOTES				

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1				
- THIS PIPING CLASS IS ORIGINALLY DESIGNED FOR ACID SERVICE				
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR				
FLANGE, BOLTING AND GASKET SELECTION				
- STANDARD LONG RADIUS ELBOWS DN80 AND LARGER SHALL BE USED				
FOR SWEEP-IN CONNECTIONS.				
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.				
- DN15-20 PIPING COMPONENTS ONLY TO BE USED FOR SHORT BRANCHES				
E.G. PRESSURE POINTS				

BRANCH CONNECTIONS 90 DEGREES										TABLE OF SCHEDULES	
BRANCHSIZE										DN	SCHEDULE
RUN	40		80		150		250				
SIZE	25	50	100	200	300						

300	C	C	X	X	X	X	X	X	X	15	160
250	C	C	X	X	X	X	X	X	X	20	160
200	C	C	X	X	X	X	X			25	160
150	C	C	X	X	X	X				40	160
100	C	C	X	X	X					50	80
80	C	C	X	X						80	80
50	C	B	A							100	80
40	B	A								150	80
25	A									200	40
										250	40
										300	40
CODE	EXPLANATION OF CHARACTERS										

A	EQUAL TEE										
B	REDUCING TEE										
C	BRANCH FITTING										
X	PIPE TO PIPE CONNECTION TO BE MADE BY SWEEP-IN OR LATERAL BRANCH										

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL		PLANT	:
CLASS NO. : 11091		CONSIGNEE	:
ANS RATING : CLASS 150		ENGINEERED BY	:
CORR. ALL. : 3 mm.		PRINCIPAL	:
REV. LETTER : A		CONTR.JOB NO.	:
REV. DATE : 12/96		PROJECT NO.	:

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE		DN 15-300	ASTM A106-B
PNPP	PIPE NIPPLE	50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE		DN 15-300	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE		---	ASTM A105
LJFL	LAP-JOINT FLANGE		---	ASTM A105
WNFL	WELDING NECK FLANGE		DN 15-300	ASTM A105

* FITTINGS

E45B	ELBOW 45 DEG BUTT-WELD ENDS		DN 15-300	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS		DN 15-300	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS		DN 15-300	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET		DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.		DN 15- 50	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS		DN 20-300	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS		DN 20-300	ASTM A234-WPB

* VALVES

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: ALLOY 20,PTFE
CHVF	CHECK VALVE FLANGED	DN 25-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: ALLOY 20
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: ALLOY 20

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 15-300	PTFE REINF.WITH MINERAL FILLER
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWGS	THERMOWELL STRAIGHT	DN 40- 40	ALLOY 20 (UNS N08020)

PIPING COMPONENTS

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		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1
PIPE NIPPLE 50MM		76.30.57	436.1	446.1	456.1	476.1							
* FLANGES													
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1
WELDING NECK FLANGE		76.62.78	402.1	404.1	406.1	408.1	360.1	362.1	364.1	366.1	318.1	320.1	322.1
* FITTINGS													
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1
* VALVES													
BALL VALVE FULL BORE FLANGED		77.00.60	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1		
		77.00.61										566.1	567.1
CHECK VALVE FLANGED		77.10.50			005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1
GLOBE VALVE FLANGED		77.30.50	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1		
* MISCELLANEOUS													
GASKET, RAISED FACE		85.48.74	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1

		RECB	REEB
		76.	76.
RUN*	BR		
20*	15	30.72.141.1	30.73.141.1
25*	20	30.72.161.1	30.73.161.1
40*	25	30.72.191.1	30.73.191.1
50*	40	30.72.208.1	30.73.208.1
80*	50	30.72.237.1	30.73.237.1
100*	80	30.72.277.1	30.73.277.1
150*	100	30.72.307.1	30.73.307.1
200*	150	30.72.336.1	30.73.336.1
250*	200	30.72.365.1	30.73.365.1
300*	250	30.72.404.1	30.73.404.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-300	021.1	016.1
20	40-300	023.1	018.1
25	40-100	025.1	020.1
	150-300	026.1	024.1
40	50-100	030.1	026.1
	150-300	031.1	028.1

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.161.1
255	76.83.37.162.1
305	76.83.37.163.1
355	76.83.37.165.1
405	76.83.37.166.1
455	76.83.37.167.1

BOLTING
 BOLTSET FLANGED JOINTS BOLTSET SPECTACLE/SPACER

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81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80	50	4	5/8	*	90
80	4	5/8	*	100	80	4	5/8	*	110
100	8	5/8	*	100	100	8	5/8	*	110
150	8	3/4	*	100	150	8	3/4	*	120
200	8	3/4	*	110	200	8	3/4	*	130
250	12	7/8	*	120	250	12	7/8	*	140
300	12	7/8	*	120	300	12	7/8	*	150

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CLASS 11125

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
DN100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
DN200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	20	80
450	C	C	C	C	E	D	D	D	E	E	E	E	E	E	A		25	80
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A			40	80
350	C	C	C	C	D	D	D	D	D	D	D	D	A				50	40
300	C	C	C	C	D	D	D	D	D	D	D	A					80	40
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	20
100	C	C	C	C	D	D	A										250	20
80	C	C	C	C	D	A											300	20
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 11125		CONSIGNEE	:	
ANS RATING : CLASS 150		ENGINEERED BY	:	
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO.	:	
REV. DATE : 12/96		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM		76.30.54	031.1	041.1	051.1	071.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.37	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE BUTT-WELD ENDS		77.11.14	053.1	054.1	055.1	057.1												
CHECK VALVE FLANGED		77.10.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.20.04								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED		77.30.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.22					002.1	004.1	006.1	008.1	020.1	021.1	022.1	023.1	024.1			

BROB				RECB				REEB				TERB				BROB				RECB				REEB				TERB				BNIF				BNIP			
76.				76.				76.				76.				76.				76.				76.				76.80.37				76.80.31							
RUN* BR																								BRANCH				RUN-PIPE											
20*	15			30.66.137.1	30.67.137.1	30.88.035.1	400* 50	79.00.278.1																						15	40-150	001.1	001.1						
25*	15			30.66.147.1	30.67.147.1	30.88.045.1	400* 80	79.00.290.1																									200-600	002.1	002.1				
25*	20			30.66.157.1	30.67.157.1	30.88.055.1	400*100	79.00.302.1																						20	40- 80	003.1	003.1						
40*	15			30.66.167.1	30.67.167.1	30.88.065.1	400*150	79.00.312.1	29.47.750.1	29.62.750.1	30.88.467.1																						100-600	004.1	004.1				
40*	20			30.66.177.1	30.67.177.1	30.88.075.1	400*200	79.00.190.1	30.66.454.1	30.67.454.1	30.88.477.1																			25	40- 40	005.1	005.1						
40*	25			30.66.187.1	30.67.187.1	30.88.085.1	400*250	79.00.197.1	30.66.463.1	30.67.463.1	30.88.503.1																						50- 50	006.1	006.1				
50*	20			30.66.192.1	30.67.192.1	30.88.100.1	400*300	79.00.207.1	30.66.470.1	30.67.470.1	30.88.529.1																						80-100	007.1	007.1				
50*	25			30.66.196.1	30.67.196.1	30.88.109.1	400*350	79.00.217.1	30.66.482.1	30.67.482.1	30.88.554.1																						150-600	008.1	008.1				
50*	40			30.66.206.1	30.67.206.1	30.88.118.1	450* 50	79.00.279.1																						40	50- 50	010.1	009.1						
80*	40			30.66.226.1	30.67.226.1	30.88.127.1	450* 80	79.00.291.1																									80- 80	011.1	010.1				
80*	50	79.00.810.1		30.66.235.1	30.67.235.1	30.88.132.1	450*100	79.00.303.1																									100-100	012.1	011.1				
100*	40			30.66.250.1	30.67.250.1	30.88.145.1	450*150	79.00.313.1																									150-300	013.1	013.1				
100*	50	79.00.812.1		30.66.265.1	30.67.265.1	30.88.153.1	450*200	79.00.191.1	30.66.501.1	30.67.501.1	30.88.578.1																						350-600	014.1	014.1				
100*	80	79.00.836.1		30.66.275.1	30.67.275.1	30.88.165.1	450*250	79.00.198.1	30.66.520.1	30.67.520.1	30.88.602.1																												
150*	50	79.00.814.1					450*300	79.00.208.1	30.66.550.1	30.67.550.1	30.88.626.1																												
150*	80	79.00.838.1		30.66.295.1	30.67.295.1	30.88.177.1	450*350	79.00.218.1	30.66.581.1	30.67.581.1	30.88.650.1																												
150*	100	79.00.860.1		30.66.305.1	30.67.305.1	30.88.189.1	450*400	79.00.228.1	30.66.611.1	30.67.611.1	30.88.674.1																												
200*	50	79.00.274.1					500* 50	79.00.280.1																															
200*	80	79.00.286.1					500* 80	79.00.292.1																															
200*	100	79.00.298.1		30.66.322.1	30.67.322.1	30.88.210.1	500*100	79.00.304.1																															
200*	150	79.00.308.1		30.66.333.1	30.67.333.1	30.88.230.1	500*150	79.00.314.1																															
250*	50	79.00.275.1					500*200	79.00.192.1	29.47.900.1	29.62.900.1	30.88.698.1																												
250*	80	79.00.287.1					500*250	79.00.199.1	30.66.633.1	30.67.633.1	30.88.722.1																												
250*	100	79.00.299.1	29.47.340.1	29.62.340.1	30.88.258.1	500*300	79.00.209.1	30.66.640.1	30.67.640.1	30.88.746.1																													
250*	150	79.00.309.1	30.66.353.1	30.67.353.1	30.88.276.1	500*350	79.00.219.1	30.66.671.1	30.67.671.1	30.88.770.1																													
250*	200	79.00.187.1	30.66.361.1	30.67.361.1	30.88.289.1	500*400	79.00.229.1	30.66.701.1	30.67.701.1	30.88.794.1																													
300*	50	79.00.276.1					500*450	79.00.250.1	30.66.731.1	30.67.731.1	30.88.818.1																												
300*	80	79.00.288.1					600* 50	79.00.282.1																															
300*	100	79.00.300.1					600* 80	79.00.294.1																															
300*	150	79.00.310.1	30.66.386.1	30.67.386.1	30.88.315.1	600*100	79.00.306.1																																
300*	200	79.00.188.1	30.66.392.1	30.67.392.1	30.88.326.1	600*150	79.00.316.1																																
300*	250	79.00.195.1	30.66.402.1	30.67.402.1	30.88.348.1	600*200	79.00.194.1																																
350*	50	79.00.277.1					600*250	79.00.200.1	30.66.801.1	30.67.801.1	30.88.842.1																												
350*	80	79.00.289.1					600*300	79.00.210.1	30.66.821.1	30.67.821.1	30.88.866.1																												
350*	100	79.00.301.1					600*350	79.00.220.1	30.66.841.1	30.67.841.1	30.88.890.1																												
350*	150	79.00.311.1	29.47.600.1	29.62.600.1	30.88.377.1	600*400	79.00.230.1	30.66.881.1	30.67.881.1	30.88.914.1																													
350*	200	79.00.189.1	30.66.423.1	30.67.423.1	30.88.388.1	600*450	79.00.254.1	30.66.911.1	30.67.911.1	30.88.938.1																													
350*	250	79.00.196.1	30.66.430.1	30.67.430.1	30.88.413.1	600*500	79.00.260.1	30.66.941.1	30.67.941.1	30.88.962.1																													
350*	300	79.00.206.1	30.66.442.1	30.67.442.1	30.88.439.1																																		

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.402.1	230	76.83.37.101.1
813	76.80.60.404.1	255	76.83.37.102.1
1219	76.80.60.406.1	305	76.83.37.103.1
1524	76.80.60.408.1	355	76.83.37.105.1
1829	76.80.60.410.1	405	76.83.37.106.1
2134	76.80.60.412.1	455	76.83.37.107.1
2438	76.80.60.414.1		
2743	76.80.60.416.1		
3048	76.80.60.418.1		

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	60	66.153.1	15	4	1/2	*	70	66.155.1
20	4	1/2	*	70	66.155.1	20	4	1/2	*	70	66.155.1
25	4	1/2	*	70	66.155.1	25	4	1/2	*	80	66.157.1
40	4	1/2	*	80	66.157.1	40	4	1/2	*	80	66.157.1
50	4	5/8	*	80	66.269.1						
80	4	5/8	*	100	66.273.1						
100	8	5/8	*	100	66.273.1						
150	8	3/4	*	100	66.329.1						
200	8	3/4	*	110	66.330.1						
250	12	7/8	*	120	66.401.1						
300	12	7/8	*	120	66.401.1						
350	12	1	*	130	66.468.1						
400	16	1	*	140	66.469.1						
450	16	1 1/8	*	150	66.529.1						
500	20	1 1/8	*	160	66.530.1						
600	20	1 1/4	*	180	66.590.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	70	66.155.1	
					20	4	1/2	*	70	66.155.1	
					25	4	1/2	*	80	66.157.1	
					40	4	1/2	*	80	66.157.1	
50	8	5/8	*	150	66.281.1	50	4	5/8	*	90	66.271.1
80	8	3/4	*	150	66.337.1	80	4	5/8	*	110	66.274.1
100	12	3/4	*	140	66.335.1	100	8	5/8	*	110	66.274.1
150	12	3/4	*	140	66.335.1	150	8	3/4	*	120	66.332.1
200	12	7/8	*	150	66.406.1	200	8	3/4	*	130	66.334.1
250	16	1	*	170	66.474.1	250	12	7/8	*	140	66.404.1
300	16	1 1/8	*	190	66.535.1	300	12	7/8	*	150	66.406.1
350	20	1 1/8	*	200	66.525.1	350	12	1	*	160	66.472.1
400	20	1 1/4	*	210	66.595.1	400	16	1	*	170	66.474.1
450	24	1 1/4	*	220	66.597.1	450	16	1 1/8	*	180	66.533.1
500	24	1 1/4	*	230	66.598.1	500	20	1 1/8	*	200	66.525.1
600	24	1 1/2	*	260	66.690.1	600	20	1 1/4	*	220	66.597.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.354.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
	8	81.38.66.155.1	
WELDING NECK FLANGE	2	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.66.153.1	
	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.66.153.1	
	4	81.38.66.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
	8	81.38.66.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.66.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.66.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.053.1	
STUD BOLT WITH NUTS	4	81.38.66.153.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* VENT POINT	DN 20	FIG.1M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	1	85.30.01.006.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.054.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.354.1	

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
DN100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
DN200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	A					50	80
300	C	C	C	C	E	E	E	E	E	E	A						80	80
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 11126		CONSIGNEE	:	
ANS RATING : CLASS 150		ENGINEERED BY	:	
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO.	:	
REV. DATE : 12/96		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 11126, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
ST3B	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWGS	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE	74.30.03	020.1	030.1	040.1	060.1	071.1	109.1	149.1	211.1	241.1	283.1	325.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM	76.30.54	036.1	046.1	056.1	076.1												
* FLANGES																	
BLIND FLANGE	76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE	76.88.37	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)	76.88.46	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE	76.62.78	402.1	404.1	406.1	408.1	360.1	362.1	314.1	316.1	258.1	260.1	262.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.17	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE BUTT-WELD ENDS	77.11.14	233.1	234.1	235.1	237.1												
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1			
GATE VALVE BUTT-WELD ENDS	77.21.14	103.1	104.1	105.1	107.1												
GATE VALVE FLANGED	77.20.04								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE BUTT-WELD ENDS	77.31.14	103.1	104.1	105.1	107.1												
GLOBE VALVE FLANGED	77.30.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN	76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET	76.62.95					760.1	762.1	564.1	566.1	508.1	510.1	512.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE	76.83.22					026.1	028.1	043.1	044.1	045.1	046.1	047.1	048.1	049.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.01.748.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.01.760.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.00.302.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.00.312.1	29.47.750.1	29.62.750.1	30.88.467.1
40* 20		30.66.181.1	30.67.181.1		400*250	79.00.115.1			
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*300	79.00.121.1			
50* 20		30.66.193.1	30.67.193.1	30.88.102.1	400*350	79.00.217.1	30.66.482.1	30.67.482.1	30.88.554.1
50* 25		30.66.199.1	30.67.199.1	30.88.111.1	450* 50	79.01.749.1			
50* 40		30.66.208.1	30.67.208.1	30.88.120.1	450* 80	79.01.761.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450*100	79.00.303.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*150	79.00.313.1			
100* 50	79.01.062.1				450*200	79.00.109.1	30.66.509.1	30.67.509.1	30.88.586.1
100* 80	79.01.086.1				450*250	79.00.116.1	30.66.532.1	30.67.532.1	30.88.610.1
150* 50	79.01.064.1				450*300	79.00.122.1	30.66.562.1	30.67.562.1	30.88.634.1
150* 80	79.01.088.1				450*350	79.00.218.1	30.66.581.1	30.67.581.1	30.88.650.1
150*100	79.00.860.1	30.66.305.1	30.67.305.1	30.88.189.1	450*400	79.00.228.1	30.66.611.1	30.67.611.1	30.88.674.1
200* 50	79.01.263.1				500* 50	79.01.750.1			
200* 80	79.01.275.1				500* 80	79.01.762.1			
200*100	79.00.390.1	30.66.324.1	30.67.324.1	30.88.211.1	500*100	79.00.304.1			
200*150	79.00.400.1	30.66.334.1	30.67.334.1	30.88.231.1	500*150	79.00.314.1			
250* 50	79.01.264.1				500*200	79.00.110.1	29.47.909.1	29.62.909.1	30.88.706.1
250* 80	79.01.276.1				500*250	79.00.117.1	30.66.639.1	30.67.639.1	30.88.730.1
250*100	79.00.391.1	29.47.342.1	29.62.342.1	30.88.259.1	500*300	79.00.123.1	30.66.652.1	30.67.652.1	30.88.754.1
250*150	79.00.401.1	30.66.352.1	30.67.352.1	30.88.277.1	500*350	79.00.219.1	30.66.671.1	30.67.671.1	30.88.770.1
250*200	79.00.458.1	30.66.363.1	30.67.363.1	30.88.290.1	500*400	79.00.229.1	30.66.701.1	30.67.701.1	30.88.794.1
300* 50	79.01.265.1				500*450	79.00.250.1	30.66.731.1	30.67.731.1	30.88.818.1
300* 80	79.01.277.1				600* 50	79.01.751.1			
300*100	79.00.392.1				600* 80	79.01.763.1			
300*150	79.00.402.1	30.66.381.1	30.67.381.1	30.88.316.1	600*100	79.00.306.1			
300*200	79.00.460.1	30.66.394.1	30.67.394.1	30.88.327.1	600*150	79.00.316.1			
300*250	79.00.476.1	30.66.403.1	30.67.403.1	30.88.349.1	600*200	79.00.111.1			
350* 50	79.01.747.1				600*250	79.00.118.1	30.66.809.1	30.67.809.1	30.88.850.1
350* 80	79.01.759.1				600*300	79.00.124.1	30.66.829.1	30.67.829.1	30.88.874.1
350*100	79.00.301.1				600*350	79.00.220.1	30.66.841.1	30.67.841.1	30.88.890.1
350*150	79.00.311.1	29.47.600.1	29.62.600.1	30.88.377.1	600*400	79.00.230.1	30.66.881.1	30.67.881.1	30.88.914.1
350*250	79.00.114.1				600*450	79.00.254.1	30.66.911.1	30.67.911.1	30.88.938.1
350*300	79.00.120.1				600*500	79.00.260.1	30.66.941.1	30.67.941.1	30.88.962.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-600	021.1	016.1
20	40-600	023.1	018.1
25	40-100	025.1	020.1
	150-600	026.1	024.1
40	50-100	030.1	026.1
	150-600	031.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.402.1			230 76.83.37.101.1
813	76.80.60.404.1			255 76.83.37.102.1
1219	76.80.60.406.1			305 76.83.37.103.1
1524	76.80.60.408.1			355 76.83.37.105.1
1829	76.80.60.410.1			405 76.83.37.106.1
2134	76.80.60.412.1			455 76.83.37.107.1
2438	76.80.60.414.1			
2743	76.80.60.416.1			
3048	76.80.60.418.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	60	66.153.1	15	4	1/2	*	70	66.155.1
20	4	1/2	*	70	66.155.1	20	4	1/2	*	70	66.155.1
25	4	1/2	*	70	66.155.1	25	4	1/2	*	80	66.157.1
40	4	1/2	*	80	66.157.1	40	4	1/2	*	80	66.157.1
50	4	5/8	*	80	66.269.1						
80	4	5/8	*	100	66.273.1						
100	8	5/8	*	100	66.273.1						
150	8	3/4	*	100	66.329.1						
200	8	3/4	*	110	66.330.1						
250	12	7/8	*	120	66.401.1						
300	12	7/8	*	120	66.401.1						
350	12	1	*	130	66.468.1						
400	16	1	*	140	66.469.1						
450	16	1 1/8	*	150	66.529.1						
500	20	1 1/8	*	160	66.530.1						
600	20	1 1/4	*	180	66.590.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	70	66.155.1	
					20	4	1/2	*	70	66.155.1	
					25	4	1/2	*	80	66.157.1	
					40	4	1/2	*	80	66.157.1	
50	8	5/8	*	150	66.281.1	50	4	5/8	*	90	66.271.1
80	8	3/4	*	150	66.337.1	80	4	5/8	*	110	66.274.1
100	12	3/4	*	140	66.335.1	100	8	5/8	*	110	66.274.1
150	12	3/4	*	140	66.335.1	150	8	3/4	*	120	66.332.1
200	12	7/8	*	150	66.406.1	200	8	3/4	*	130	66.334.1
250	16	1	*	170	66.474.1	250	12	7/8	*	140	66.404.1
300	16	1 1/8	*	190	66.535.1	300	12	7/8	*	150	66.406.1
350	20	1 1/8	*	200	66.525.1	350	12	1	*	160	66.472.1
400	20	1 1/4	*	210	66.595.1	400	16	1	*	170	66.474.1
450	24	1 1/4	*	220	66.597.1	450	16	1 1/8	*	180	66.533.1
500	24	1 1/4	*	230	66.598.1	500	20	1 1/8	*	200	66.525.1
600	24	1 1/2	*	260	66.690.1	600	20	1 1/4	*	220	66.597.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
	8	81.38.66.155.1	
WELDING NECK FLANGE	2	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.66.153.1	
	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.66.153.1	
	4	81.38.66.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.66.153.1	
	8	81.38.66.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.66.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.66.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.103.1	
STUD BOLT WITH NUTS	4	81.38.66.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* VENT POINT	DN 20	FIG.1M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	1	85.30.01.006.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.104.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

CLASS 11172

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	-50	0	50	75	100	125	150	175	200
	PRESSURE BAR GA								
DN15 - 80	18.2	18.2	18.0	17.5	17.0	16.4	15.8	14.8	11.0
DN100-150	18.2	18.2	18.0	17.5	17.0	16.4	15.8	14.8	9.0
DN200-600	18.2	18.2	18.0	17.5	17.0	16.4	15.8	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	D	D	D	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	20	80
450	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A		25	80
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A			40	80
350	C	C	C	C	D	D	D	D	D	D	D	A					50	40
300	C	C	C	C	D	D	D	D	D	D	A						80	40
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	20
100	C	C	C	C	D	D	A										250	20
80	C	C	C	C	D	A											300	20
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	PLANT :	
CLASS NO. : 11172	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 11172, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7/A194-4
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7/A194-4
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
ITEM DESCRIPTION		MESC																

* PIPE																		
PIPE		74.30.17	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	091.1	103.1	115.1	129.1	139.1	164.1	204.1	234.1
PIPE NIPPLE	50MM	76.31.57	531.1	541.1	551.1	571.1												
* FLANGES																		
BLIND FLANGE		76.62.12	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	482.1	484.1	486.1	488.1	490.1	492.1
SPECTACLE BLIND FLANGE		76.88.34	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPACER RING TYPE (ASME FLANGE)		76.88.17	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	094.1
WELDING NECK FLANGE		76.62.82	152.1	154.1	156.1	158.1	110.1	112.1	114.1	116.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	024.1
* FITTINGS																		
CAP BUTT-WELD.END		76.31.18	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
EQUAL TEE BUTT-WELD ENDS		76.31.84	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE FLANGED		77.10.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.20.33								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.30.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	302.1	304.1	306.1	308.1												
ORIFICE FLANGE SET		76.62.97					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.19					502.1	504.1	506.1	508.1	520.1	521.1	522.1	523.1	524.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		31.70.137.1	31.71.137.1	31.85.035.1	400* 50	79.04.278.1			
25* 15		31.70.147.1	31.71.147.1	31.85.045.1	400* 80	79.04.290.1			
25* 20		31.70.157.1	31.71.157.1	31.85.055.1	400*100	79.04.302.1			
40* 15		31.70.167.1	31.71.167.1	31.85.065.1	400*150	79.04.312.1	29.44.750.1	29.59.750.1	31.85.467.1
40* 20		31.70.177.1	31.71.177.1	31.85.075.1	400*200	79.04.190.1	31.70.454.1	31.71.454.1	31.85.477.1
40* 25		31.70.187.1	31.71.187.1	31.85.085.1	400*250	79.04.207.1	31.70.463.1	31.71.463.1	31.85.503.1
50* 20		29.44.192.1	29.59.192.1	31.85.100.1	400*300	79.04.217.1	31.70.470.1	31.71.470.1	31.85.529.1
50* 25		31.70.198.1	31.71.198.1	31.85.109.1	400*350	79.04.227.1	31.70.482.1	31.71.482.1	31.85.554.1
50* 40		31.70.206.1	31.71.206.1	31.85.118.1	450* 50	79.04.279.1			
80* 40		31.70.226.1	31.71.226.1	31.85.127.1	450* 80	79.04.291.1			
80* 50	79.04.810.1	31.70.235.1	31.71.235.1	31.85.132.1	450*100	79.04.303.1			
100* 40		31.70.250.1	31.71.250.1	31.85.145.1	450*150	79.04.313.1			
100* 50	79.04.812.1	31.70.265.1	31.71.265.1	31.85.153.1	450*200	79.04.191.1	31.70.501.1	31.71.501.1	31.85.578.1
100* 80	79.04.836.1	31.70.275.1	31.71.275.1	31.85.165.1	450*250	79.04.208.1	31.70.520.1	31.71.520.1	31.85.602.1
150* 50	79.04.814.1			450*300	79.04.218.1	31.70.550.1	31.71.550.1	31.85.626.1	
150* 80	79.04.838.1	31.70.295.1	31.71.295.1	31.85.177.1	450*350	79.04.228.1	31.70.581.1	31.71.581.1	31.85.650.1
150*100	79.04.860.1	31.70.305.1	31.71.305.1	31.85.189.1	450*400	79.04.238.1	31.70.611.1	31.71.611.1	31.85.674.1
200* 50	79.04.274.1			500* 50	79.04.280.1				
200* 80	79.04.286.1			500* 80	79.04.292.1				
200*100	79.04.298.1	31.70.322.1	31.71.322.1	31.85.210.1	500*100	79.04.304.1			
200*150	79.04.308.1	31.70.333.1	31.71.333.1	31.85.230.1	500*150	79.04.314.1			
250* 50	79.04.275.1			500*200	79.04.192.1	29.44.900.1	29.59.900.1	31.85.698.1	
250* 80	79.04.287.1			500*250	79.04.209.1	31.70.633.1	31.71.633.1	31.85.722.1	
250*100	79.04.299.1	29.44.340.1	29.59.340.1	31.85.258.1	500*300	79.04.219.1	31.70.640.1	31.71.640.1	31.85.746.1
250*150	79.04.309.1	31.70.353.1	31.71.353.1	31.85.276.1	500*350	79.04.229.1	31.70.671.1	31.71.671.1	31.85.770.1
250*200	79.04.187.1	31.70.361.1	31.71.361.1	31.85.289.1	500*400	79.04.239.1	31.70.701.1	31.71.701.1	31.85.794.1
300* 50	79.04.276.1			500*450	79.04.250.1	31.70.731.1	31.71.731.1	31.85.818.1	
300* 80	79.04.288.1			600* 50	79.04.282.1				
300*100	79.04.300.1			600* 80	79.04.294.1				
300*150	79.04.310.1	31.70.386.1	31.71.386.1	31.85.315.1	600*100	79.04.306.1			
300*200	79.04.188.1	31.70.392.1	31.71.392.1	31.85.326.1	600*150	79.04.316.1			
300*250	79.04.205.1	31.70.402.1	31.71.402.1	31.85.348.1	600*200	79.04.194.1			
350* 50	79.04.277.1			600*250	79.04.210.1	31.70.801.1	31.71.801.1	31.85.842.1	
350* 80	79.04.289.1			600*300	79.04.220.1	31.70.821.1	31.71.821.1	31.85.866.1	
350*100	79.04.301.1			600*350	79.04.230.1	31.70.841.1	31.71.841.1	31.85.890.1	
350*150	79.04.311.1	29.44.600.1	29.59.600.1	31.85.377.1	600*400	79.04.240.1	31.70.881.1	31.71.881.1	31.85.914.1
350*200	79.04.189.1	31.70.423.1	31.71.423.1	31.85.388.1	600*450	79.04.254.1	31.70.911.1	31.71.911.1	31.85.938.1
350*250	79.04.206.1	31.70.430.1	31.71.430.1	31.85.413.1	600*500	79.04.260.1	31.70.941.1	31.71.941.1	31.85.962.1
350*300	79.04.216.1	31.70.442.1	31.71.442.1	31.85.439.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	501.1	101.1
	200-600	502.1	102.1
20	40- 80	503.1	103.1
	100-600	504.1	104.1
25	40- 40	505.1	105.1
	50- 50	506.1	106.1
	80-100	507.1	107.1
	150-600	508.1	108.1
40	50- 50	510.1	109.1
	80- 80	511.1	110.1
	100-100	512.1	111.1
	150-300	513.1	113.1
	350-600	514.1	114.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.67.052.1	450	76.81.67.552.1
840	76.81.67.054.1	840	76.81.67.554.1
1230	76.81.67.056.1	1230	76.81.67.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.242.1	230	76.83.37.101.1
813	76.80.60.244.1	255	76.83.37.102.1
1219	76.80.60.246.1	305	76.83.37.103.1
1524	76.80.60.248.1	355	76.83.37.105.1
1829	76.80.60.250.1	405	76.83.37.106.1
2134	76.80.60.252.1	455	76.83.37.107.1
2438	76.80.60.254.1		
2743	76.80.60.256.1		
3048	76.80.60.258.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	60	63.153.1	15	4	1/2	*	70	63.155.1
20	4	1/2	*	70	63.155.1	20	4	1/2	*	70	63.155.1
25	4	1/2	*	70	63.155.1	25	4	1/2	*	80	63.157.1
40	4	1/2	*	80	63.157.1	40	4	1/2	*	80	63.157.1
50	4	5/8	*	80	63.269.1						
80	4	5/8	*	100	63.273.1						
100	8	5/8	*	100	63.273.1						
150	8	3/4	*	100	63.329.1						
200	8	3/4	*	110	63.330.1						
250	12	7/8	*	120	63.401.1						
300	12	7/8	*	120	63.401.1						
350	12	1	*	130	63.468.1						
400	16	1	*	140	63.469.1						
450	16	1 1/8	*	150	63.529.1						
500	20	1 1/8	*	160	63.530.1						
600	20	1 1/4	*	180	63.590.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	70	63.155.1	
					20	4	1/2	*	70	63.155.1	
					25	4	1/2	*	80	63.157.1	
					40	4	1/2	*	80	63.157.1	
50	8	5/8	*	150	63.281.1	50	4	5/8	*	90	63.271.1
80	8	3/4	*	150	63.337.1	80	4	5/8	*	110	63.274.1
100	12	3/4	*	140	63.335.1	100	8	5/8	*	110	63.274.1
150	12	3/4	*	140	63.335.1	150	8	3/4	*	120	63.332.1
200	12	7/8	*	150	63.406.1	200	8	3/4	*	130	63.334.1
250	16	1	*	170	63.474.1	250	12	7/8	*	140	63.404.1
300	16	1 1/8	*	190	63.535.1	300	12	7/8	*	150	63.406.1
350	20	1 1/8	*	200	63.524.1	350	12	1	*	160	63.472.1
400	20	1 1/4	*	210	63.595.1	400	16	1	*	170	63.474.1
450	24	1 1/4	*	220	63.597.1	450	16	1 1/8	*	180	63.533.1
500	24	1 1/4	*	230	63.598.1	500	20	1 1/8	*	200	63.524.1
600	24	1 1/2	*	260	63.690.1	600	20	1 1/4	*	220	63.597.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.003.1	
BLIND FLANGE	1	76.62.12.458.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.153.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* DRAIN POINT	DN 20	FIG.2J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.004.1	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.154.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.004.1	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.33.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.806.1	
STUD BOLT WITH NUTS	8	81.38.63.153.1	
	8	81.38.63.155.1	
WELDING NECK FLANGE	2	76.62.82.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.806.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	4	81.38.63.153.1	
	4	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.806.1	
STUD BOLT WITH NUTS	4	81.38.63.153.1	
	4	81.38.63.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.33.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.806.1	
STUD BOLT WITH NUTS	8	81.38.63.153.1	
	8	81.38.63.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.63.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.63.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.458.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.33.003.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.153.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.33.004.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.154.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.33.004.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	

CLASS 11173

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	-50	0	50	75	100	125	150	175	200
	PRESSURE BAR GA								
DN15 -80	18.2	18.2	18.0	17.5	17.0	16.4	15.8	14.8	11.0
DN100-150	18.2	18.2	18.0	17.5	17.0	16.4	15.8	14.8	9.0
DN200-600	18.2	18.2	18.0	17.5	17.0	16.4	15.8	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3, AND LIMITED BY BS5351 BALL VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
- WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.
- FOR AMMONIA, SODIUM, SODIUM-CARBONATE AND SODIUM-SULFHITE SERVICES, THROUGH-VISION LEVELGAUGES SHALL BE USED ONLY. PTFE-SHIELDS SHALL BE APPLIED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	D	D	D	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	20	80
450	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A		25	80
400	C	C	C	C	D	D	D	D	D	D	D	D	A				40	80
350	C	C	C	C	D	D	D	D	D	D	D	A					50	40
300	C	C	C	C	D	D	D	D	D	D	A						80	40
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	20
100	C	C	C	C	D	D	A										250	20
80	C	C	C	C	D	A											300	20
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
 B REDUCING TEE
 C BRANCH FITTING
 D PIPE TO PIPE
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR PWHT	PLANT :	
CLASS NO. : 11173	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/LCC TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A350-LF2
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7/A194-4
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7/A194-4
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
ITEM DESCRIPTION		MESC																

* PIPE																		
PIPE		74.30.17	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	091.1	103.1	115.1	129.1	139.1	164.1	204.1	234.1
PIPE NIPPLE	50MM	76.31.57	531.1	541.1	551.1	571.1												
* FLANGES																		
BLIND FLANGE		76.62.12	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	482.1	484.1	486.1	488.1	490.1	492.1
SPECTACLE BLIND FLANGE		76.88.34	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPACER RING TYPE (ASME FLANGE)		76.88.17	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	094.1
WELDING NECK FLANGE		76.62.82	152.1	154.1	156.1	158.1	110.1	112.1	114.1	116.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	024.1
* FITTINGS																		
CAP BUTT-WELD.END		76.31.18	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
EQUAL TEE BUTT-WELD ENDS		76.31.84	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.38	203.1	204.1	205.1	207.1	208.1	210.1	212.1	264.1	265.1	266.1						
CHECK VALVE FLANGED		77.10.38	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	012.0	012.1	023.1
GATE VALVE FLANGED		77.20.38								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.30.38	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	302.1	304.1	306.1	308.1												
ORIFICE FLANGE SET		76.62.96					640.1	642.1	544.1	546.1	504.1	506.1	508.1	510.1	512.1	514.1	516.1	518.1
STRAINER Y-TYPE		76.83.19					802.1	804.1	806.1	808.1	809.1	811.1	813.1	815.1	817.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		31.70.137.1	31.71.137.1	31.85.035.1	400* 50	79.04.278.1			
25* 15		31.70.147.1	31.71.147.1	31.85.045.1	400* 80	79.04.290.1			
25* 20		31.70.157.1	31.71.157.1	31.85.055.1	400*100	79.04.302.1			
40* 15		31.70.167.1	31.71.167.1	31.85.065.1	400*150	79.04.312.1	29.44.750.1	29.59.750.1	31.85.467.1
40* 20		31.70.177.1	31.71.177.1	31.85.075.1	400*200	79.04.190.1	31.70.454.1	31.71.454.1	31.85.477.1
40* 25		31.70.187.1	31.71.187.1	31.85.085.1	400*250	79.04.207.1	31.70.463.1	31.71.463.1	31.85.503.1
50* 20		29.44.192.1	29.59.192.1	31.85.100.1	400*300	79.04.217.1	31.70.470.1	31.71.470.1	31.85.529.1
50* 25		31.70.198.1	31.71.198.1	31.85.109.1	400*350	79.04.227.1	31.70.482.1	31.71.482.1	31.85.554.1
50* 40		31.70.206.1	31.71.206.1	31.85.118.1	450* 50	79.04.279.1			
80* 40		31.70.226.1	31.71.226.1	31.85.127.1	450* 80	79.04.291.1			
80* 50	79.04.810.1	31.70.235.1	31.71.235.1	31.85.132.1	450*100	79.04.303.1			
100* 40		31.70.250.1	31.71.250.1	31.85.145.1	450*150	79.04.313.1			
100* 50	79.04.812.1	31.70.265.1	31.71.265.1	31.85.153.1	450*200	79.04.191.1	31.70.501.1	31.71.501.1	31.85.578.1
100* 80	79.04.836.1	31.70.275.1	31.71.275.1	31.85.165.1	450*250	79.04.208.1	31.70.520.1	31.71.520.1	31.85.602.1
150* 50	79.04.814.1				450*300	79.04.218.1	31.70.550.1	31.71.550.1	31.85.626.1
150* 80	79.04.838.1	31.70.295.1	31.71.295.1	31.85.177.1	450*350	79.04.228.1	31.70.581.1	31.71.581.1	31.85.650.1
150*100	79.04.860.1	31.70.305.1	31.71.305.1	31.85.189.1	450*400	79.04.238.1	31.70.611.1	31.71.611.1	31.85.674.1
200* 50	79.04.274.1				500* 50	79.04.280.1			
200* 80	79.04.286.1				500* 80	79.04.292.1			
200*100	79.04.298.1	31.70.322.1	31.71.322.1	31.85.210.1	500*100	79.04.304.1			
200*150	79.04.308.1	31.70.333.1	31.71.333.1	31.85.230.1	500*150	79.04.314.1			
250* 50	79.04.275.1				500*200	79.04.192.1	29.44.900.1	29.59.900.1	31.85.698.1
250* 80	79.04.287.1				500*250	79.04.209.1	31.70.633.1	31.71.633.1	31.85.722.1
250*100	79.04.299.1	29.44.340.1	29.59.340.1	31.85.258.1	500*300	79.04.219.1	31.70.640.1	31.71.640.1	31.85.746.1
250*150	79.04.309.1	31.70.353.1	31.71.353.1	31.85.276.1	500*350	79.04.229.1	31.70.671.1	31.71.671.1	31.85.770.1
250*200	79.04.187.1	31.70.361.1	31.71.361.1	31.85.289.1	500*400	79.04.239.1	31.70.701.1	31.71.701.1	31.85.794.1
300* 50	79.04.276.1				500*450	79.04.250.1	31.70.731.1	31.71.731.1	31.85.818.1
300* 80	79.04.288.1				600* 50	79.04.282.1			
300*100	79.04.300.1				600* 80	79.04.294.1			
300*150	79.04.310.1	31.70.386.1	31.71.386.1	31.85.315.1	600*100	79.04.306.1			
300*200	79.04.188.1	31.70.392.1	31.71.392.1	31.85.326.1	600*150	79.04.316.1			
300*250	79.04.205.1	31.70.402.1	31.71.402.1	31.85.348.1	600*200	79.04.194.1			
350* 50	79.04.277.1				600*250	79.04.210.1	31.70.801.1	31.71.801.1	31.85.842.1
350* 80	79.04.289.1				600*300	79.04.220.1	31.70.821.1	31.71.821.1	31.85.866.1
350*100	79.04.301.1				600*350	79.04.230.1	31.70.841.1	31.71.841.1	31.85.890.1
350*150	79.04.311.1	29.44.600.1	29.59.600.1	31.85.377.1	600*400	79.04.240.1	31.70.881.1	31.71.881.1	31.85.914.1
350*200	79.04.189.1	31.70.423.1	31.71.423.1	31.85.388.1	600*450	79.04.254.1	31.70.911.1	31.71.911.1	31.85.938.1
350*250	79.04.206.1	31.70.430.1	31.71.430.1	31.85.413.1	600*500	79.04.260.1	31.70.941.1	31.71.941.1	31.85.962.1
350*300	79.04.216.1	31.70.442.1	31.71.442.1	31.85.439.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	501.1	101.1
	200-600	502.1	102.1
20	40- 80	503.1	103.1
	100-600	504.1	104.1
25	40- 40	505.1	105.1
	50- 50	506.1	106.1
	80-100	507.1	107.1
	150-600	508.1	108.1
40	50- 50	510.1	109.1
	80- 80	511.1	110.1
	100-100	512.1	111.1
	150-300	513.1	113.1
	350-600	514.1	114.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.67.152.1	450	76.81.67.652.1
840	76.81.67.154.1	840	76.81.67.654.1
1230	76.81.67.156.1	1230	76.81.67.656.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.59.242.1	230	76.83.37.101.1
813	76.80.59.244.1	255	76.83.37.102.1
1219	76.80.59.246.1	305	76.83.37.103.1
1524	76.80.59.248.1	355	76.83.37.105.1
1829	76.80.59.250.1	405	76.83.37.106.1
2134	76.80.59.252.1	455	76.83.37.107.1
2438	76.80.59.254.1		
2743	76.80.59.256.1		
3048	76.80.59.258.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	60	63.153.1	15	4	1/2	*	70	63.155.1
20	4	1/2	*	70	63.155.1	20	4	1/2	*	70	63.155.1
25	4	1/2	*	70	63.155.1	25	4	1/2	*	80	63.157.1
40	4	1/2	*	80	63.157.1	40	4	1/2	*	80	63.157.1
50	4	5/8	*	80	63.269.1						
80	4	5/8	*	100	63.273.1						
100	8	5/8	*	100	63.273.1						
150	8	3/4	*	100	63.329.1						
200	8	3/4	*	110	63.330.1						
250	12	7/8	*	120	63.401.1						
300	12	7/8	*	120	63.401.1						
350	12	1	*	130	63.468.1						
400	16	1	*	140	63.469.1						
450	16	1 1/8	*	150	63.529.1						
500	20	1 1/8	*	160	63.530.1						
600	20	1 1/4	*	180	63.590.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	70	63.155.1	
					20	4	1/2	*	70	63.155.1	
					25	4	1/2	*	80	63.157.1	
					40	4	1/2	*	80	63.157.1	
50	8	5/8	*	150	63.281.1	50	4	5/8	*	90	63.271.1
80	8	3/4	*	150	63.337.1	80	4	5/8	*	110	63.274.1
100	12	3/4	*	140	63.335.1	100	8	5/8	*	110	63.274.1
150	12	3/4	*	140	63.335.1	150	8	3/4	*	120	63.332.1
200	12	7/8	*	150	63.406.1	200	8	3/4	*	130	63.334.1
250	16	1	*	170	63.474.1	250	12	7/8	*	140	63.404.1
300	16	1 1/8	*	190	63.535.1	300	12	7/8	*	150	63.406.1
350	20	1 1/8	*	200	63.524.1	350	12	1	*	160	63.472.1
400	20	1 1/4	*	210	63.595.1	400	16	1	*	170	63.474.1
450	24	1 1/4	*	220	63.597.1	450	16	1 1/8	*	180	63.533.1
500	24	1 1/4	*	230	63.598.1	500	20	1 1/8	*	200	63.524.1
600	24	1 1/2	*	260	63.690.1	600	20	1 1/4	*	220	63.597.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.203.1	
BLIND FLANGE	1	76.62.12.458.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.153.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* DRAIN POINT	DN 20	FIG.2J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.204.1	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.154.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.204.1	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.38.203.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.806.1	
STUD BOLT WITH NUTS	8	81.38.63.153.1	
	8	81.38.63.155.1	
WELDING NECK FLANGE	2	76.62.82.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.203.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.806.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	4	81.38.63.153.1	
	4	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.203.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.806.1	
STUD BOLT WITH NUTS	4	81.38.63.153.1	
	4	81.38.63.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.38.203.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.806.1	
STUD BOLT WITH NUTS	8	81.38.63.153.1	
	8	81.38.63.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.63.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.63.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.458.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.38.003.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.153.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.38.004.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.154.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.38.004.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	

CLASS 11175

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	-50	0	50	100	150	200	250	300	340

	PRESSURE BAR GA								
DN15 -600	18.2	18.2	18.0	17.0	15.8	13.9	12.0	10.2	8.7

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	D	D	D	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	20	80
450	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A		25	80
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A			40	80
350	C	C	C	C	D	D	D	D	D	D	D	A					50	40
300	C	C	C	C	D	D	D	D	D	D	A						80	40
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	20
100	C	C	C	C	D	D	A										250	20
80	C	C	C	C	D	A											300	20
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	SOUR	PLANT	:	
CLASS NO. : 11175		CONSIGNEE	:	
ANS RATING : CLASS 150		ENGINEERED BY	:	
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO.	:	
REV. DATE : 12/96		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	LJ END FLANGES: ASTM A350-LF2 ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.16	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	091.1	103.1	115.1	129.1	139.1	164.1	204.1	234.1
PIPE NIPPLE 50MM		76.31.57	631.1	641.1	651.1	671.1												
* FLANGES																		
BLIND FLANGE		76.62.12	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	482.1	484.1	486.1	488.1	490.1	492.1
SPECTACLE BLIND FLANGE		76.88.35	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPACER RING TYPE (ASME FLANGE)		76.88.47	008.1	012.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	040.1	044.1
WELDING NECK FLANGE		76.62.82	152.1	154.1	156.1	158.1	110.1	112.1	114.1	116.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	024.1
* FITTINGS																		
CAP BUTT-WELD.END		76.31.17	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.34	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.43	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
EQUAL TEE BUTT-WELD ENDS		76.31.80	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	282.1	303.1	325.1	345.1	365.1	384.1	394.1	404.1
* VALVES																		
CHECK VALVE FLANGED		77.10.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.20.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.30.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	302.1	304.1	306.1	308.1												
ORIFICE FLANGE SET		76.62.97					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.22					502.1	504.1	506.1	508.1	520.1	521.1	522.1	523.1	524.1			

BROB				RECB				REEB				TERB				BROB				RECB				REEB				TERB				BNIF		BNIP					
76.				76.				76.				76.				76.				76.				76.				76.80.37		76.80.31									
RUN* BR																								BRANCH		RUN-PIPE													
20*	15			31.66.137.1	31.75.137.1	31.88.035.1	400* 50	79.04.278.1																									15	40-150	501.1	101.1			
25*	15			31.66.147.1	31.75.147.1	31.88.045.1	400* 80	79.04.290.1																											200-600	502.1	102.1		
25*	20			31.66.157.1	31.75.157.1	31.88.055.1	400*100	79.04.302.1																											20	40- 80	503.1	103.1	
40*	15			31.66.167.1	31.75.167.1	31.88.065.1	400*150	79.04.312.1	29.45.750.1	29.60.750.1	31.88.467.1																									100-600	504.1	104.1	
40*	20			31.66.177.1	31.75.177.1	31.88.075.1	400*200	79.04.190.1	31.66.454.1	31.75.454.1	31.88.477.1																									25	40- 40	505.1	105.1
40*	25			31.66.187.1	31.75.187.1	31.88.085.1	400*250	79.04.207.1	31.66.463.1	31.75.463.1	31.88.503.1																									50- 50	506.1	106.1	
50*	20			31.66.192.1	31.75.192.1	31.88.100.1	400*300	79.04.217.1	31.66.470.1	31.75.470.1	31.88.529.1																									80-100	507.1	107.1	
50*	25			31.66.198.1	31.75.198.1	31.88.109.1	400*350	79.04.227.1	31.66.482.1	31.75.482.1	31.88.554.1																									150-600	508.1	108.1	
50*	40			31.66.206.1	31.75.206.1	31.88.118.1	450* 50	79.04.279.1																											40	50- 50	510.1	109.1	
80*	40			31.66.226.1	31.75.226.1	31.88.127.1	450* 80	79.04.291.1																												80- 80	511.1	110.1	
80*	50	79.04.810.1		31.66.235.1	31.75.235.1	31.88.132.1	450*100	79.04.303.1																												100-100	512.1	111.1	
100*	40			31.66.250.1	31.75.250.1	31.88.145.1	450*150	79.04.313.1																												150-300	513.1	113.1	
100*	50	79.04.812.1		31.66.265.1	31.75.265.1	31.88.153.1	450*200	79.04.191.1	31.66.501.1	31.75.501.1	31.88.578.1																									350-600	514.1	114.1	
100*	80	79.04.836.1		31.66.275.1	31.75.275.1	31.88.165.1	450*250	79.04.208.1	31.66.520.1	31.75.520.1	31.88.602.1																												
150*	50	79.04.814.1					450*300	79.04.218.1	31.66.550.1	31.75.550.1	31.88.626.1																												
150*	80	79.04.838.1		31.66.295.1	31.75.295.1	31.88.177.1	450*350	79.04.228.1	31.66.581.1	31.75.581.1	31.88.650.1																												
150*	100	79.04.860.1		31.66.305.1	31.75.305.1	31.88.189.1	450*400	79.04.238.1	31.66.611.1	31.75.611.1	31.88.674.1																												
200*	50	79.04.274.1					500* 50	79.04.280.1																															
200*	80	79.04.286.1					500* 80	79.04.292.1																															
200*	100	79.04.298.1		31.66.322.1	31.75.322.1	31.88.210.1	500*100	79.04.304.1																															
200*	150	79.04.308.1		31.66.333.1	31.75.333.1	31.88.230.1	500*150	79.04.314.1																															
250*	50	79.04.275.1					500*200	79.04.192.1	29.45.900.1	29.60.900.1	31.88.698.1																												
250*	80	79.04.287.1					500*250	79.04.209.1	29.45.933.1	29.60.933.1	31.88.722.1																												
250*	100	79.04.299.1	29.45.340.1	29.60.340.1	31.88.258.1	500*300	79.04.219.1	31.66.640.1	31.75.640.1	31.88.746.1																													
250*	150	79.04.309.1	31.66.353.1	31.75.353.1	31.88.276.1	500*350	79.04.229.1	31.66.671.1	31.75.671.1	31.88.770.1																													
250*	200	79.04.187.1	31.66.361.1	31.75.361.1	31.88.289.1	500*400	79.04.239.1	31.66.701.1	31.75.701.1	31.88.794.1																													
300*	50	79.04.276.1					500*450	79.04.250.1	31.66.731.1	31.75.731.1	31.88.818.1																												
300*	80	79.04.288.1					600* 50	79.04.282.1																															
300*	100	79.04.300.1					600* 80	79.04.294.1																															
300*	150	79.04.310.1	31.66.386.1	31.75.386.1	31.88.315.1	600*100	79.04.306.1																																
300*	200	79.04.188.1	31.66.392.1	31.75.392.1	31.88.326.1	600*150	79.04.316.1																																
300*	250	79.04.205.1	31.66.402.1	31.75.402.1	31.88.348.1	600*200	79.04.194.1																																
350*	50	79.04.277.1					600*250	79.04.210.1	31.66.801.1	31.75.801.1	31.88.842.1																												
350*	80	79.04.289.1					600*300	79.04.220.1	31.66.821.1	31.75.821.1	31.88.866.1																												
350*	100	79.04.301.1					600*350	79.04.230.1	31.66.841.1	31.75.841.1	31.88.890.1																												
350*	150	79.04.311.1	29.45.600.1	29.60.600.1	31.88.377.1	600*400	79.04.240.1	31.66.881.1	31.75.881.1	31.88.914.1																													
350*	200	79.04.189.1	31.66.423.1	31.75.423.1	31.88.388.1	600*450	79.04.254.1	31.66.911.1	31.75.911.1	31.88.938.1																													
350*	250	79.04.206.1	31.66.430.1	31.75.430.1	31.88.413.1	600*500	79.04.260.1	31.66.941.1	31.75.941.1	31.88.962.1																													
350*	300	79.04.216.1	31.66.442.1	31.75.442.1	31.88.439.1																																		

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

LEVEL		DISPLACER		CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER	LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----	-----	-----	-----	-----
356	76.80.60.582.1	230	76.83.37.101.1				
813	76.80.60.584.1	255	76.83.37.102.1				
1219	76.80.60.586.1	305	76.83.37.103.1				
1524	76.80.60.588.1	355	76.83.37.105.1				
1829	76.80.60.590.1	405	76.83.37.106.1				
2134	76.80.60.592.1	455	76.83.37.107.1				
2438	76.80.60.594.1						
2743	76.80.60.596.1						
3048	76.80.60.598.1						

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.458.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.33.003.1	
PIPE NIPPLE 50MM	1	76.31.57.631.1	
STUD BOLT WITH NUTS	8	81.38.67.153.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.33.004.1	
PIPE NIPPLE 50MM	1	76.31.57.641.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.154.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.33.004.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.33.003.1	
LAP-JOINT FLANGE	2	76.62.20.806.1	
STUD BOLT WITH NUTS	8	81.38.67.153.1	
	8	81.38.67.155.1	
WELDING NECK FLANGE	2	76.62.82.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.33.003.1	
LAP-JOINT FLANGE	1	76.62.20.806.1	
PIPE NIPPLE 50MM	1	76.31.57.631.1	
STUD BOLT WITH NUTS	4	81.38.67.153.1	
	4	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.33.003.1	
LAP-JOINT FLANGE	1	76.62.20.806.1	
STUD BOLT WITH NUTS	4	81.38.67.153.1	
	4	81.38.67.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.33.003.1	
LAP-JOINT FLANGE	2	76.62.20.806.1	
STUD BOLT WITH NUTS	8	81.38.67.153.1	
	8	81.38.67.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.67.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.67.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.458.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.33.003.1	
PIPE NIPPLE 50MM	1	76.31.57.631.1	
STUD BOLT WITH NUTS	8	81.38.67.153.1	
WELDING NECK FLANGE	1	76.62.82.152.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.33.004.1	
PIPE NIPPLE 50MM	1	76.31.57.641.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.154.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.33.004.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	

CLASS 11176

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	-50	0	50	100	150	200	250	300	340

	PRESSURE BAR GA								
DN15 -600	18.2	18.2	18.0	17.0	15.8	13.9	12.0	10.2	8.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 160
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	80 80
250	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	100 40
200	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	150 40
150	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	200 30
100	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	250 30
80	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	300 30
50	C	C	C	C	B	A											350 20
40	C	B	B	B	A												400 20
25	B	B	B	A													450 20
20	B	A															500 20
15	A																600 20

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	SOUR	PLANT	:	
CLASS NO.	: 11176	CONSIGNEE	:	
ANS RATING	: CLASS 150	ENGINEERED BY	:	
CORR. ALL.	: 3 mm.	PRINCIPAL	:	
REV. LETTER	: A	CONTR.JOB NO.	:	
REV. DATE	: 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7M/A194-7M
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A350-LF2
ST3B	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																	
PIPE	74.30.16	023.1	030.1	038.1	054.1	061.1	069.1	075.1	084.1	093.1	105.1	117.1	129.1	139.1	164.1	204.1	234.1
* FLANGES																	
BLIND FLANGE	76.62.12	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	482.1	484.1	486.1	488.1	490.1	492.1
SPECTACLE BLIND FLANGE	76.88.35	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPACER RING TYPE (ASME FLANGE)	76.88.47	008.1	012.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	040.1	044.1
WELDING NECK FLANGE	76.62.82	182.1	184.1	186.1	188.1	160.1	162.1	114.1	116.1	058.1	060.1	062.1	014.1	016.1	018.1	020.1	024.1
* FITTINGS																	
CAP BUTT-WELD.END	76.31.17	172.1	178.1	182.1	192.1	210.1	230.1	246.1	266.1	283.1	304.1	326.1	345.1	365.1	384.1	394.1	404.1
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	172.1	178.1	182.1	192.1	210.1	230.1	246.1	266.1	283.1	304.1	326.1	345.1	365.1	384.1	394.1	404.1
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	172.1	178.1	182.1	192.1	210.1	230.1	246.1	266.1	283.1	304.1	326.1	345.1	365.1	384.1	394.1	404.1
EQUAL TEE BUTT-WELD ENDS	76.31.80	172.1	178.1	182.1	192.1	210.1	230.1	246.1	266.1	283.1	304.1	326.1	345.1	365.1	384.1	394.1	404.1
* VALVES																	
CHECK VALVE FLANGED	77.10.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED	77.20.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED	77.30.33	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN	76.65.96	302.1	304.1	306.1	308.1												
ORIFICE FLANGE SET	76.62.97					760.1	762.1	564.1	566.1	508.1	510.1	512.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE	76.83.22					526.1	528.1	543.1	544.1	545.1	546.1	547.1	548.1	549.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		31.66.141.1	31.75.141.1	31.88.039.1	400* 50	79.05.738.1			
25* 15		31.66.151.1	31.75.151.1	31.88.049.1	400* 80	79.05.748.1			
25* 20		31.66.161.1	31.75.161.1	31.88.059.1	400*100	79.04.302.1			
40* 15		31.66.171.1	31.75.171.1	31.88.069.1	400*150	79.04.312.1	29.45.750.1	29.60.750.1	31.88.467.1
40* 20		31.66.181.1	31.75.181.1	31.88.079.1	400*250	79.04.115.1			
40* 25		31.66.191.1	31.75.191.1	31.88.089.1	400*300	79.04.121.1			
50* 20		31.66.193.1	31.75.193.1	31.88.102.1	400*350	79.04.227.1	31.66.482.1	31.75.482.1	31.88.554.1
50* 25		31.66.199.1	31.75.199.1	31.88.111.1	450* 50	79.05.739.1			
50* 40		31.66.208.1	31.75.208.1	31.88.120.1	450* 80	79.05.749.1			
80* 40		31.66.229.1	31.75.229.1	31.88.129.1	450*100	79.04.303.1			
80* 50	79.05.360.1	31.66.237.1	31.75.237.1	31.88.133.1	450*150	79.04.313.1			
100* 50	79.05.062.1				450*200	79.04.109.1	31.66.509.1	31.75.509.1	
100* 80	79.05.086.1				450*250	79.04.116.1	31.66.532.1	31.75.532.1	31.88.610.1
150* 50	79.05.064.1				450*300	79.04.122.1	31.66.562.1	31.75.562.1	31.88.634.1
150* 80	79.05.088.1				450*350	79.04.228.1	31.66.581.1	31.75.581.1	31.88.650.1
150*100	79.04.860.1	31.66.305.1	31.75.305.1	31.88.189.1	450*400	79.04.238.1	31.66.611.1	31.75.611.1	31.88.674.1
200* 50	79.05.263.1				500* 50	79.05.740.1			
200* 80	79.05.275.1				500* 80	79.05.750.1			
200*100	79.04.390.1	31.66.324.1	31.75.324.1	31.88.211.1	500*100	79.04.304.1			
200*150	79.04.400.1	31.66.334.1	31.75.334.1	31.88.231.1	500*150	79.04.314.1			
250* 50	79.05.264.1				500*200	79.04.110.1	29.45.909.1	29.60.909.1	31.88.706.1
250* 80	79.05.276.1				500*250	79.04.117.1	31.66.639.1	31.75.639.1	31.88.730.1
250*100	79.04.391.1	29.45.342.1	29.60.342.1	31.88.259.1	500*300	79.04.123.1	31.66.652.1	31.75.652.1	31.88.754.1
250*150	79.04.401.1	31.66.352.1	31.75.352.1	31.88.277.1	500*350	79.04.229.1	31.66.671.1	31.75.671.1	31.88.770.1
250*200	79.04.458.1	31.66.363.1	31.75.363.1	31.88.290.1	500*400	79.04.239.1	31.66.701.1	31.75.701.1	31.88.794.1
300* 50	79.05.265.1				500*450	79.04.250.1	31.66.731.1	31.75.731.1	31.88.818.1
300* 80	79.05.277.1				600* 50	79.05.741.1			
300*100	79.04.392.1				600* 80	79.05.751.1			
300*150	79.04.402.1	31.66.381.1	31.75.381.1	31.88.316.1	600*100	79.04.306.1			
300*200	79.04.460.1	31.66.394.1	31.75.394.1	31.88.327.1	600*150	79.04.316.1			
300*250	79.04.476.1	31.66.403.1	31.75.403.1	31.88.349.1	600*250	79.04.118.1	31.66.809.1	31.75.809.1	31.88.850.1
350* 50	79.05.737.1				600*300	79.04.124.1	31.66.829.1	31.75.829.1	31.88.874.1
350* 80	79.05.747.1				600*350	79.04.230.1	31.66.841.1	31.75.841.1	31.88.890.1
350*100	79.04.301.1				600*400	79.04.240.1	31.66.881.1	31.75.881.1	31.88.914.1
350*150	79.04.311.1	29.45.600.1	29.60.600.1	31.88.377.1	600*450	79.04.254.1	31.66.911.1	31.75.911.1	31.88.938.1
350*250	79.04.114.1				600*500	79.04.260.1	31.66.941.1	31.75.941.1	31.88.962.1
350*300	79.04.120.1								

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-600	521.1	116.1
20	40-600	523.1	118.1
25	40-100	525.1	120.1
	150-600	526.1	124.1
40	50-100	530.1	126.1
	150-600	531.1	128.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.68.052.1	450	76.81.68.552.1
840	76.81.68.054.1	840	76.81.68.554.1
1230	76.81.68.056.1	1230	76.81.68.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.582.1	230	76.83.37.101.1
813	76.80.60.584.1	255	76.83.37.102.1
1219	76.80.60.586.1	305	76.83.37.103.1
1524	76.80.60.588.1	355	76.83.37.105.1
1829	76.80.60.590.1	405	76.83.37.106.1
2134	76.80.60.592.1	455	76.83.37.107.1
2438	76.80.60.594.1		
2743	76.80.60.596.1		
3048	76.80.60.598.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.458.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.33.003.1	
PIPE NIPPLE 50MM	1	76.31.57.636.1	
STUD BOLT WITH NUTS	8	81.38.67.153.1	
WELDING NECK FLANGE	1	76.62.82.182.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.33.004.1	
PIPE NIPPLE 50MM	1	76.31.57.646.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.184.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.20.33.004.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.33.003.1	
LAP-JOINT FLANGE	2	76.62.20.806.1	
STUD BOLT WITH NUTS	8	81.38.67.153.1	
	8	81.38.67.155.1	
WELDING NECK FLANGE	2	76.62.82.182.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.33.003.1	
LAP-JOINT FLANGE	1	76.62.20.806.1	
PIPE NIPPLE 50MM	1	76.31.57.636.1	
STUD BOLT WITH NUTS	4	81.38.67.153.1	
	4	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.182.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.20.33.003.1	
LAP-JOINT FLANGE	1	76.62.20.806.1	
STUD BOLT WITH NUTS	4	81.38.67.153.1	
	4	81.38.67.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.20.33.003.1	
LAP-JOINT FLANGE	2	76.62.20.806.1	
STUD BOLT WITH NUTS	8	81.38.67.153.1	
	8	81.38.67.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.67.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.67.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.458.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.33.003.1	
PIPE NIPPLE 50MM	1	76.31.57.636.1	
STUD BOLT WITH NUTS	8	81.38.67.153.1	
WELDING NECK FLANGE	1	76.62.82.182.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.33.004.1	
PIPE NIPPLE 50MM	1	76.31.57.646.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.184.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.462.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.33.004.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	

CLASS 11201

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS		
	0	50	60

	PRESSURE BAR GA		
DN15 -600	16.0	16.0	16.0

- NOTES
-
- DESIGN LIMITS ACC.TO BS5155 BUTTERFLY VALVE RATING
 - FOR HYDRANT VALVES, SEE MESC 96.25 SUB GROUP 10, 11 OR 16
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	15 80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	20 80
450	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A		25 80
400	C	C	C	C	D	D	D	D	D	D	D	D	D	A			40 80
350	C	C	C	C	D	D	D	D	D	D	D	A					50 40
300	C	C	C	C	D	D	D	D	D	D	A						80 40
250	C	C	C	C	D	D	D	D	D	A							100 40
200	C	C	C	C	D	D	D	D	A								150 40
150	C	C	C	C	D	D	D	D	A								200 20
100	C	C	C	C	D	D	A										250 20
80	C	C	C	C	D	A											300 20
50	C	C	C	B	A												350 20
40	C	B	B	A													400 20
25	B	B	A														450 20
20	B	A															500 20
15	A																600 20

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 11201	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B
PNPT	PIPE NIPPLE PLAIN/THREADED	---	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
CAPT	CAP THREADED	---	ASTM A105
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L) LINING: CHLOROPRENE RUBBER
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT,STELLITE 6,FKM
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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		NOMINAL PIPE SIZE															
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																	
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)	74.13.14								211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	
PIPE (API 5L-B, SAW)	74.13.17																569.1
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE	76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE	76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
BUTTERFLY VALVE WAFER TYPE	77.60.11					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1												
	77.10.20					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.00					508.1	510.1	512.1	514.1	515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
GATE VALVE FLANGED	77.20.20								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED	77.30.05	003.1	004.1	005.1	007.1												
	77.30.20					008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN	76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE	76.83.19					402.1	404.1	406.1	408.1	420.1	421.1	422.1	423.1	424.1			

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		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	001.1	001.1
	200-600	002.1	002.1
20	40- 80	003.1	003.1
	100-600	004.1	004.1
25	40- 40	005.1	005.1
	50- 50	006.1	006.1
	80-100	007.1	007.1
	150-600	008.1	008.1
40	50- 50	010.1	009.1
	80- 80	011.1	010.1
	100-100	012.1	011.1
	150-300	013.1	013.1
	350-600	014.1	014.1

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP. NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET BS5155 BFLY VALVE

BOLTSET FLANGED JOINTS

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	

					15	4	1/2	* 60	61.153.1
					20	4	1/2	* 70	61.155.1
					25	4	1/2	* 70	61.155.1
					40	4	1/2	* 80	61.157.1
50	4	5/8	* 130	61.278.1	50	4	5/8	* 80	61.269.1
80	4	5/8	* 150	61.281.1	80	4	5/8	* 100	61.273.1
100	8	5/8	* 150	61.281.1	100	8	5/8	* 100	61.273.1
150	8	3/4	* 160	61.338.1	150	8	3/4	* 100	61.329.1
200	8	3/4	* 170	61.340.1	200	8	3/4	* 110	61.330.1
250	12	7/8	* 190	61.412.1	250	12	7/8	* 120	61.401.1
300	12	7/8	* 210	61.415.1	300	12	7/8	* 120	61.401.1
350	12	1	* 230	61.483.1	350	12	1	* 130	61.468.1
400	16	1	* 250	61.486.1	400	16	1	* 140	61.469.1
450	16	1 1/8	* 280	61.549.1	450	16	1 1/8	* 150	61.529.1
500	20	1 1/8	* 290	61.551.1	500	20	1 1/8	* 160	61.530.1
600	20	1 1/4	* 340	61.616.1	600	20	1 1/4	* 180	61.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	

15	4	1/2	* 70	61.155.1					
20	4	1/2	* 70	61.155.1					
25	4	1/2	* 80	61.157.1					
40	4	1/2	* 80	61.157.1					
					50	8	5/8	* 150	61.281.1
					80	8	3/4	* 150	61.337.1
					100	12	3/4	* 140	61.335.1
					150	12	3/4	* 140	61.335.1
					200	12	7/8	* 150	61.406.1
					250	16	1	* 170	61.474.1
					300	16	1 1/8	* 190	61.535.1
					350	20	1 1/8	* 200	61.525.1
					400	20	1 1/4	* 210	61.595.1
					450	24	1 1/4	* 220	61.597.1
					500	24	1 1/4	* 230	61.598.1
					600	24	1 1/2	* 260	61.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	

15	4	1/2	* 70	61.155.1					
20	4	1/2	* 70	61.155.1					
25	4	1/2	* 80	61.157.1					
40	4	1/2	* 80	61.157.1					
50	4	5/8	* 90	61.271.1	50	4	5/8	* 150	61.281.1
80	4	5/8	* 110	61.274.1	80	4	5/8	* 170	61.284.1
100	8	5/8	* 110	61.274.1	100	8	5/8	* 170	61.284.1
150	8	3/4	* 120	61.332.1	150	8	3/4	* 210	61.346.1
200	8	3/4	* 130	61.334.1	200	8	3/4	* 240	61.351.1
250	12	7/8	* 140	61.404.1	250	12	7/8	* 290	61.428.1
300	12	7/8	* 150	61.406.1	300	12	7/8	* 310	61.432.1
350	12	1	* 160	61.472.1	350	12	1	* 330	61.500.1
400	16	1	* 170	61.474.1	400	16	1	* 330	61.500.1
450	16	1 1/8	* 180	61.533.1	450	16	1 1/8	* 360	61.562.1
500	20	1 1/8	* 200	61.525.1	500	20	1 1/8	* 390	61.566.1
600	20	1 1/4	* 220	61.597.1	600	20	1 1/4	* 400	61.625.1

ASSEMBLIES

* DRAIN POINT			DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.003.1	
BLIND FLANGE			1	76.62.11.058.1	
GASKET, RF TANGED INSERT			2	85.30.01.004.1	
STUD BOLT WITH NUTS			8	81.38.61.153.1	
WELDING NECK FLANGE			1	76.62.78.352.1	

* DRAIN POINT			DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.004.1	
BLIND FLANGE			1	76.62.11.062.1	
GASKET, RF TANGED INSERT			2	85.30.01.006.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	
WELDING NECK FLANGE			1	76.62.78.354.1	

* DRAIN POINT			DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.004.1	
BLIND FLANGE			1	76.62.11.062.1	
GASKET, RF TANGED INSERT			2	85.30.01.006.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	

* ORIFICE INSTR.CONN.			DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			2	77.00.03.003.1	
GASKET, RF TANGED INSERT			4	85.30.01.004.1	
LAP-JOINT FLANGE			2	76.62.20.208.1	
STUD BOLT WITH NUTS			8	81.38.61.153.1	
			8	81.38.61.155.1	
WELDING NECK FLANGE			2	76.62.78.352.1	

* PRESSURE INSTR.CONN.			DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.003.1	
GASKET, RF TANGED INSERT			2	85.30.01.004.1	
LAP-JOINT FLANGE			1	76.62.20.208.1	
STUD BOLT WITH NUTS			4	81.38.61.153.1	
			4	81.38.61.155.1	
WELDING NECK FLANGE			1	76.62.78.352.1	

* PRESSURE INSTR.CONN.			DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.003.1	
GASKET, RF TANGED INSERT			2	85.30.01.004.1	
LAP-JOINT FLANGE			1	76.62.20.208.1	
STUD BOLT WITH NUTS			4	81.38.61.153.1	
			4	81.38.61.155.1	

* METERRUN INSTR. CONN			DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			2	77.00.03.003.1	
GASKET, RF TANGED INSERT			4	85.30.01.004.1	
LAP-JOINT FLANGE			2	76.62.20.208.1	
STUD BOLT WITH NUTS			8	81.38.61.153.1	
			8	81.38.61.155.1	

* TEMPERATURE INSTR.C.			DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE			1	76.62.60.531.1	
GASKET, RF TANGED INSERT			1	85.30.01.012.1	
STUD BOLT WITH NUTS			4	81.38.61.159.1	
THERMOWELL STRAIGHT			L=230 MM	1	76.83.37.101.1

* TEMPERATURE INSTR.C.			DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE			1	76.62.60.531.1	
GASKET, RF TANGED INSERT			1	85.30.01.012.1	
STUD BOLT WITH NUTS			4	81.38.61.159.1	
THERMOWELL STRAIGHT			L=255 MM	1	76.83.37.102.1

* VENT POINT			DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.058.1	
GASKET, RF TANGED INSERT			2	85.30.01.004.1	
GLOBE VALVE FLANGED			1	77.30.05.003.1	
STUD BOLT WITH NUTS			8	81.38.61.153.1	
WELDING NECK FLANGE			1	76.62.78.352.1	

* VENT POINT			DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.062.1	
GASKET, RF TANGED INSERT			2	85.30.01.006.1	
GLOBE VALVE FLANGED			1	77.30.05.004.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	
WELDING NECK FLANGE			1	76.62.78.354.1	

* VENT POINT			DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.062.1	
GASKET, RF TANGED INSERT			2	85.30.01.006.1	
GLOBE VALVE FLANGED			1	77.30.05.004.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	

CLASS 11261

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	19.6	19.2	17.6	15.8	13.9	12.0	10.2	8.3	6.5

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - MAX. OPERATING TEMP. FOR ANS 150 STEAM/CONDENSATE LEVEL-GAUGES IS 194 DEG.C.,BEING THE TEMP. OF THE SATURATED STEAM.
 - API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A	20 80	
450	C	C	C	C	E	D	D	D	E	E	E	E	E	A		25 80	
400	C	C	C	C	D	D	D	D	D	D	D	D	A			40 80	
350	C	C	C	C	D	D	D	D	D	D	D	A				50 40	
300	C	C	C	C	D	D	D	D	D	D	A					80 40	
250	C	C	C	C	D	D	D	D	D	A						100 40	
200	C	C	C	C	D	D	D	D	A							150 40	
150	C	C	C	C	D	D	D	A								200 20	
100	C	C	C	C	D	D	A									250 20	
80	C	C	C	C	D	A										300 20	
50	C	C	C	B	A											350 20	
40	C	B	B	A												400 20	
25	B	B	A													450 20	
20	B	A														500 20	
15	A															600 20	

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 11261	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 11261, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B
PNPT	PIPE NIPPLE PLAIN/THREADED	---	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
CAPT	CAP THREADED	---	ASTM A105
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GABS	GATE VALVE SW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVS	GATE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLBS	GLOBE VALVE SW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
SIBS	STEAM TRAP INV.BUCKET S.W.	DN 15- 20	AISI 304(L)
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																	
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)	74.13.14								211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	
PIPE (API 5L-B, SAW)	74.13.17																569.1
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE	76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE	76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1												
	77.10.20					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE SOCKET WELD	77.11.04	003.1	004.1	005.1	007.1												
GATE VALVE SW BELLOWS SEALED	77.21.05	053.1	054.1	055.1	057.1												
GATE VALVE FLANGED	77.20.04	003.1	004.1	005.1	007.1												
	77.20.20					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE SOCKET WELD	77.21.04	003.1	004.1	005.1	007.1												
GLOBE VALVE SW BELLOWS SEALED	77.31.03	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED	77.30.05	003.1	004.1	005.1	007.1												
	77.30.20					008.1	010.1	012.1	014.1	015.1							
GLOBE VALVE SOCKET WELD	77.31.04	003.1	004.1	005.1	007.1												
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.41.46	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN	76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1
STEAM TRAP INV.BUCKET S.W.	76.83.30	008.1	010.1														
STRAINER Y-TYPE	76.83.19					402.1	404.1	406.1	408.1	420.1	421.1	422.1	423.1	424.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.278.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.290.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.302.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.312.1	29.46.750.1	29.61.750.1	30.89.467.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.190.1	30.72.454.1	30.73.454.1	30.89.477.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.197.1	30.72.463.1	30.73.463.1	30.89.503.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.207.1	30.72.470.1	30.73.470.1	30.89.529.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.217.1	30.72.482.1	30.73.482.1	30.89.554.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.279.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.291.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.303.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.313.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.191.1	30.72.501.1	30.73.501.1	30.89.578.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.198.1	30.72.520.1	30.73.520.1	30.89.602.1
150* 50	79.00.814.1				450*300	79.00.208.1	30.72.550.1	30.73.550.1	30.89.626.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.218.1	30.72.581.1	30.73.581.1	30.89.650.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.228.1	30.72.611.1	30.73.611.1	30.89.674.1
200* 50	79.00.274.1				500* 50	79.00.280.1			
200* 80	79.00.286.1				500* 80	79.00.292.1			
200*100	79.00.298.1	30.72.322.1	30.73.322.1	30.89.210.1	500*100	79.00.304.1			
200*150	79.00.308.1	30.72.333.1	30.73.333.1	30.89.230.1	500*150	79.00.314.1			
250* 50	79.00.275.1				500*200	79.00.192.1	29.46.900.1	29.61.900.1	30.89.698.1
250* 80	79.00.287.1				500*250	79.00.199.1	30.72.633.1	30.73.633.1	30.89.722.1
250*100	79.00.299.1	29.46.340.1	29.61.340.1	30.89.258.1	500*300	79.00.209.1	30.72.640.1	30.73.640.1	30.89.746.1
250*150	79.00.309.1	30.72.353.1	30.73.353.1	30.89.276.1	500*350	79.00.219.1	30.72.671.1	30.73.671.1	30.89.770.1
250*200	79.00.187.1	30.72.361.1	30.73.361.1	30.89.289.1	500*400	79.00.229.1	30.72.701.1	30.73.701.1	30.89.794.1
300* 50	79.00.276.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.00.288.1				600* 50	79.00.282.1			
300*100	79.00.300.1				600* 80	79.00.294.1			
300*150	79.00.310.1	30.72.386.1	30.73.386.1	30.89.315.1	600*100	79.00.306.1			
300*200	79.00.188.1	30.72.392.1	30.73.392.1	30.89.326.1	600*150	79.00.316.1			
300*250	79.00.195.1	30.72.402.1	30.73.402.1	30.89.348.1	600*200	79.00.194.1			
350* 50	79.00.277.1				600*250	79.00.200.1	30.72.801.1	30.73.801.1	30.89.842.1
350* 80	79.00.289.1				600*300	79.00.210.1	30.72.821.1	30.73.821.1	30.89.866.1
350*100	79.00.301.1				600*350	79.00.220.1	30.72.841.1	30.73.841.1	30.89.890.1
350*150	79.00.311.1	29.46.600.1	29.61.600.1	30.89.377.1	600*400	79.00.230.1	30.72.881.1	30.73.881.1	30.89.914.1
350*200	79.00.189.1	30.72.423.1	30.73.423.1	30.89.388.1	600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*250	79.00.196.1	30.72.430.1	30.73.430.1	30.89.413.1	600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1
350*300	79.00.206.1	30.72.442.1	30.73.442.1	30.89.439.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	001.1	001.1
	200-600	002.1	002.1
20	40- 80	003.1	003.1
	100-600	004.1	004.1
25	40- 40	005.1	005.1
	50- 50	006.1	006.1
	80-100	007.1	007.1
	150-600	008.1	008.1
40	50- 50	010.1	009.1
	80- 80	011.1	010.1
	100-100	012.1	011.1
	150-300	013.1	013.1
	350-600	014.1	014.1

LEVEL GAUGE REFLEX	
LENGTH MESCNUMBER	
-----	-----
450	76.81.65.552.1
840	76.81.65.554.1
1230	76.81.65.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH MESCNUMBER		LENGTH MESCNUMBER	
-----	-----	-----	-----
356	76.80.60.042.1	230	76.83.37.101.1
813	76.80.60.044.1	255	76.83.37.102.1
1219	76.80.60.046.1	305	76.83.37.103.1
1524	76.80.60.048.1	355	76.83.37.105.1
1829	76.80.60.050.1	405	76.83.37.106.1
2134	76.80.60.052.1	455	76.83.37.107.1
2438	76.80.60.054.1		
2743	76.80.60.056.1		
3048	76.80.60.058.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
15	4	1/2	*	60	61.153.1	15	4	1/2	*	70	61.155.1
20	4	1/2	*	70	61.155.1	20	4	1/2	*	70	61.155.1
25	4	1/2	*	70	61.155.1	25	4	1/2	*	80	61.157.1
40	4	1/2	*	80	61.157.1	40	4	1/2	*	80	61.157.1
50	4	5/8	*	80	61.269.1						
80	4	5/8	*	100	61.273.1						
100	8	5/8	*	100	61.273.1						
150	8	3/4	*	100	61.329.1						
200	8	3/4	*	110	61.330.1						
250	12	7/8	*	120	61.401.1						
300	12	7/8	*	120	61.401.1						
350	12	1	*	130	61.468.1						
400	16	1	*	140	61.469.1						
450	16	1 1/8	*	150	61.529.1						
500	20	1 1/8	*	160	61.530.1						
600	20	1 1/4	*	180	61.590.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
						15	4	1/2	*	70	61.155.1
						20	4	1/2	*	70	61.155.1
						25	4	1/2	*	80	61.157.1
						40	4	1/2	*	80	61.157.1
50	8	5/8	*	150	61.281.1	50	4	5/8	*	90	61.271.1
80	8	3/4	*	150	61.337.1	80	4	5/8	*	110	61.274.1
100	12	3/4	*	140	61.335.1	100	8	5/8	*	110	61.274.1
150	12	3/4	*	140	61.335.1	150	8	3/4	*	120	61.332.1
200	12	7/8	*	150	61.406.1	200	8	3/4	*	130	61.334.1
250	16	1	*	170	61.474.1	250	12	7/8	*	140	61.404.1
300	16	1 1/8	*	190	61.535.1	300	12	7/8	*	150	61.406.1
350	20	1 1/8	*	200	61.525.1	350	12	1	*	160	61.472.1
400	20	1 1/4	*	210	61.595.1	400	16	1	*	170	61.474.1
450	24	1 1/4	*	220	61.597.1	450	16	1 1/8	*	180	61.533.1
500	24	1 1/4	*	230	61.598.1	500	20	1 1/8	*	200	61.525.1
600	24	1 1/2	*	260	61.690.1	600	20	1 1/4	*	220	61.597.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0B	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.108.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.131.1	

* DRAIN POINT	DN 20	FIG.0B	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.112.1	
GATE VALVE SOCKET WELD	1	77.21.04.004.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.141.1	

* DRAIN POINT	DN 20	FIG.0A	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.112.1	
GATE VALVE SOCKET WELD	1	77.21.04.004.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.141.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0D	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.004.1	
GATE VALVE SOCKET WELD	2	77.21.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.004.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0D	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.004.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.352.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.004.1	
GATE VALVE FLANGED	2	77.20.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, SPIRAL WOUND	1	85.41.46.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, SPIRAL WOUND	1	85.41.46.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1B	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.108.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.003.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.131.1	

* VENT POINT	DN 20	FIG.1B	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.112.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.004.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.141.1	

* VENT POINT	DN 20	FIG.1A	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
CAP THREADED	1	76.05.18.112.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.004.1	
PIPE NIPPLE PLAIN/THREADED	1	76.05.57.141.1	

CLASS 11300

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
DN100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
DN200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40	80
350	C	C	C	C	D	D	D	D	D	D	D	D	A				50	40
300	C	C	C	C	E	E	E	E	E	E	E	E	A				80	40
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	D	A							150	40
150	C	C	C	C	D	D	D	D	D	A							200	20
100	C	C	C	C	D	D	A										250	20
80	C	C	C	C	D	A											300	20
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 11300	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 11300, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L), PTFE
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT,STELLITE 6,FKM
GAVF	GATE VALVE FLANGED	DN300-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLBF	GLOBE VALVE FLG. BELLOWS SEAL.	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L), GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWGS	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE (API 5L-B, SML)		74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)		74.13.14								211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	
PIPE (API 5L-B, SAW)		74.13.17																569.1
PIPE		74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1	469.1	521.1	569.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE		76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE		76.62.78	352.1	354.1	356.1	358.1	310.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1	782.1	805.1	825.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.00	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1						
CHECK VALVE FLANGED		77.10.21	003.1	004.1	005.1	007.1												
DUAL PL. CHECK VALVE WAFER LUG		77.67.49					008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	022.1
GATE VALVE FLANGED		77.20.20											417.1	418.1	419.1	420.1	421.1	423.1
GLOBE VALVE FLG. BELLWAS SEAL.		77.30.20	503.1	504.1	505.1	507.1	508.1	510.1	512.1	514.1	515.1							
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	304.1	306.1	308.1	312.1	314.1	318.1	320.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	342.1
METER RUN		76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	484.1

BROB					RECB					REEB					TERB					BNIF					BNIP																																																	
76.					76.					76.					76.					76.80.37					76.80.31																																																	
RUN* BR																				BRANCH					RUN-PIPE																																																	
20* 15					30.72.137.1					30.73.137.1					30.89.035.1					400* 50					79.00.278.1					15					40-150					001.1					001.1																													
25* 15					30.72.147.1					30.73.147.1					30.89.045.1					400* 80					79.00.290.1										200-600					002.1					002.1																													
25* 20					30.72.157.1					30.73.157.1					30.89.055.1					400*100					79.00.302.1					20					40- 80					003.1					003.1																													
40* 15					30.72.167.1					30.73.167.1					30.89.065.1					400*150					79.00.312.1					29.46.750.1					29.61.750.1					30.89.467.1					100-600					004.1					004.1																			
40* 20					30.72.177.1					30.73.177.1					30.89.075.1					400*200					79.00.190.1					30.72.454.1					30.73.454.1					30.89.477.1					40- 40					005.1					005.1																			
40* 25					30.72.187.1					30.73.187.1					30.89.085.1					400*250					79.00.197.1					30.72.463.1					30.73.463.1					30.89.503.1					50- 50					006.1					006.1																			
50* 20					29.46.192.1					29.61.192.1					30.89.100.1					400*300					79.00.207.1					30.72.470.1					30.73.470.1					30.89.529.1					80-100					007.1					007.1																			
50* 25					30.72.196.1					30.73.196.1					30.89.109.1					400*350					79.00.217.1					30.72.482.1					30.73.482.1					30.89.554.1					150-600					008.1					008.1																			
50* 40					30.72.206.1					30.73.206.1					30.89.118.1					450* 50					79.00.279.1																				40					50- 50					010.1					009.1														
80* 40					30.72.226.1					30.73.226.1					30.89.127.1					450* 80					79.00.291.1																									80- 80					011.1					010.1														
80* 50					79.00.810.1					30.72.235.1					30.73.235.1					30.89.132.1					450*100					79.00.303.1																									100-100					012.1					011.1									
100* 40										30.72.250.1					30.73.250.1					30.89.145.1					450*150					79.00.313.1																									150-300					013.1					013.1									
100* 50					79.00.812.1					30.72.265.1					30.73.265.1					30.89.153.1					450*200					79.00.191.1					30.72.501.1					30.73.501.1					30.89.578.1					350-600					014.1					014.1														
100* 80					79.00.836.1					30.72.275.1					30.73.275.1					30.89.165.1					450*250					79.00.198.1					30.72.520.1					30.73.520.1					30.89.602.1																													
150* 50					79.00.814.1															450*300					79.00.208.1					30.72.550.1					30.73.550.1					30.89.626.1																																		
150* 80					79.00.838.1					30.72.295.1					30.73.295.1					30.89.177.1					450*350					79.00.218.1					30.72.581.1					30.73.581.1					30.89.650.1																													
150*100					79.00.860.1					30.72.305.1					30.73.305.1					30.89.189.1					450*400					79.00.228.1					30.72.611.1					30.73.611.1					30.89.674.1																													
200* 50					79.00.274.1															500* 50					79.00.280.1																																																	
200* 80					79.00.286.1															500* 80					79.00.292.1																																																	
200*100					79.00.298.1					30.72.322.1					30.73.322.1					30.89.210.1					500*100					79.00.304.1																																												
200*150					79.00.308.1					30.72.333.1					30.73.333.1					30.89.230.1					500*150					79.00.314.1																																												
250* 50					79.00.275.1															500*200					79.00.192.1					29.46.900.1					29.61.900.1					30.89.698.1																																		
250* 80					79.00.287.1															500*250					79.00.199.1					30.72.633.1					30.73.633.1					30.89.722.1																																		
250*100					79.00.299.1					29.46.340.1					29.61.340.1					30.89.258.1					500*300					79.00.209.1					30.72.640.1					30.73.640.1					30.89.746.1																													
250*150					79.00.309.1					30.72.353.1					30.73.353.1					30.89.276.1					500*350					79.00.219.1					30.72.671.1					30.73.671.1					30.89.770.1																													
250*200					79.00.187.1					30.72.361.1					30.73.361.1					30.89.289.1					500*400					79.00.229.1					30.72.701.1					30.73.701.1					30.89.794.1																													
300* 50					79.00.276.1															500*450					79.00.250.1					30.72.731.1					30.73.731.1					30.89.818.1																																		
300* 80					79.00.288.1															600* 50					79.00.282.1																																																	
300*100					79.00.300.1															600* 80					79.00.294.1																																																	
300*150					79.00.310.1					30.72.386.1					30.73.386.1					30.89.315.1					600*100					79.00.306.1																																												
300*200					79.00.188.1					30.72.392.1					30.73.392.1					30.89.326.1					600*150					79.00.316.1																																												
300*250					79.00.195.1					30.72.402.1					30.73.402.1					30.89.348.1					600*200					79.00.194.1																																												
350* 50					79.00.277.1															600*250					79.00.200.1					30.72.801.1					30.73.801.1					30.89.842.1																																		
350* 80					79.00.289.1															600*300					79.00.210.1					30.72.821.1					30.73.821.1					30.89.866.1																																		
350*100					79.00.301.1															600*350					79.00.220.1					30.72.841.1					30.73.841.1					30.89.890.1																																		
350*150					79.00.311.1					29.46.600.1					29.61.600.1					30.89.377.1					600*400					79.00.230.1					30.72.881.1					30.73.881.1					30.89.914.1																													
350*200					79.00.189.1					30.72.423.1					30.73.423.1					30.89.388.1					600*450					79.00.254.1					30.72.911.1					30.73.911.1					30.89.938.1																													
350*250					79.00.196.1					30.72.430.1					30.73.430.1					30.89.413.1					600*500					79.00.260.1					30.72.941.1					30.73.941.1					30.89.962.1																													
350*300					79.00.206.1					30.72.442.1					30.73.442.1					30.89.439.1																																																						

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT			DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.00.203.1	
BLIND FLANGE			1	76.62.11.058.1	
GASKET, SPIRAL WOUND			2	85.41.46.304.1	
STUD BOLT WITH NUTS			8	81.38.61.153.1	
WELDING NECK FLANGE			1	76.62.78.352.1	

* DRAIN POINT			DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.00.204.1	
BLIND FLANGE			1	76.62.11.062.1	
GASKET, SPIRAL WOUND			2	85.41.46.306.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	
WELDING NECK FLANGE			1	76.62.78.354.1	

* DRAIN POINT			DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.00.204.1	
BLIND FLANGE			1	76.62.11.062.1	
GASKET, SPIRAL WOUND			2	85.41.46.306.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	

* ORIFICE INSTR.CONN.			DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			2	77.00.00.203.1	
GASKET, SPIRAL WOUND			4	85.41.46.304.1	
LAP-JOINT FLANGE			2	76.62.20.208.1	
STUD BOLT WITH NUTS			8	81.38.61.153.1	
			8	81.38.61.155.1	
WELDING NECK FLANGE			2	76.62.78.352.1	

* PRESSURE INSTR.CONN.			DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.00.203.1	
GASKET, SPIRAL WOUND			2	85.41.46.304.1	
LAP-JOINT FLANGE			1	76.62.20.208.1	
STUD BOLT WITH NUTS			4	81.38.61.153.1	
			4	81.38.61.155.1	
WELDING NECK FLANGE			1	76.62.78.352.1	

* PRESSURE INSTR.CONN.			DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.00.203.1	
GASKET, SPIRAL WOUND			2	85.41.46.304.1	
LAP-JOINT FLANGE			1	76.62.20.208.1	
STUD BOLT WITH NUTS			4	81.38.61.153.1	
			4	81.38.61.155.1	

* METERRUN INSTR. CONN			DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			2	77.00.00.203.1	
GASKET, SPIRAL WOUND			4	85.41.46.304.1	
LAP-JOINT FLANGE			2	76.62.20.208.1	
STUD BOLT WITH NUTS			8	81.38.61.153.1	
			8	81.38.61.155.1	

* TEMPERATURE INSTR.C.			DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE			1	76.62.60.531.1	
GASKET, SPIRAL WOUND			1	85.41.46.312.1	
STUD BOLT WITH NUTS			4	81.38.61.159.1	
THERMOWELL STRAIGHT			L=230 MM	1	76.83.37.101.1

* TEMPERATURE INSTR.C.			DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE			1	76.62.60.531.1	
GASKET, SPIRAL WOUND			1	85.41.46.312.1	
STUD BOLT WITH NUTS			4	81.38.61.159.1	
THERMOWELL STRAIGHT			L=255 MM	1	76.83.37.102.1

* VENT POINT			DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.058.1	
GASKET, SPIRAL WOUND			2	85.41.46.304.1	
GLOBE VALVE FLG. BELLOWS SEAL.			1	77.30.20.503.1	
STUD BOLT WITH NUTS			8	81.38.61.153.1	
WELDING NECK FLANGE			1	76.62.78.352.1	

* VENT POINT			DN 20	FIG.1H	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.062.1	
GASKET, SPIRAL WOUND			2	85.41.46.306.1	
GLOBE VALVE FLG. BELLOWS SEAL.			1	77.30.20.504.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	

* VENT POINT			DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.062.1	
GASKET, SPIRAL WOUND			2	85.41.46.306.1	
GLOBE VALVE FLG. BELLOWS SEAL.			1	77.30.20.504.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	

CLASS 11372

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
DN100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
DN200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
- WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	80
300	C	C	C	C	E	D	E	E	E	E	E	A					80	80
250	C	C	C	C	D	D	D	D	D	D	A						100	40
200	C	C	C	C	D	D	D	D	D	A							150	40
150	C	C	C	C	D	D	D	D	A								200	30
100	C	C	C	C	D	D	D	A									250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	C	B	A											350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
 B REDUCING TEE
 C BRANCH FITTING
 D PIPE TO PIPE
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT	PLANT	:	
CLASS NO. : 11372		CONSIGNEE	:	
ANS RATING : CLASS 150		ENGINEERED BY :		
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : B		CONTR.JOB NO. :		
REV. DATE : 12/98		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 11372, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC TRIM: AISI 316 (L) ,PTFE
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
ST3B	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

11372, REV.B PAGE 3

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																	
PIPE	74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	149.1	211.1	241.1	283.1	325.1	373.1	421.1	469.1	521.1	569.1
* FLANGES																	
BLIND FLANGE	76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE	76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE	76.62.78	402.1	404.1	406.1	408.1	360.1	362.1	314.1	316.1	258.1	260.1	262.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	095.1	115.1	133.1	153.1	173.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.08	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE FLANGED	77.10.12	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1			
GATE VALVE FLANGED	77.20.36								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED	77.30.12	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN	76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET	76.62.96					190.1	192.1	044.1	046.1	020.1	022.1	024.1	010.1	012.1	014.1	016.1	018.1
STRAINER Y-TYPE	76.83.19					326.1	328.1	343.1	344.1	345.1	346.1	347.1	348.1	349.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.748.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.760.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.00.302.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.00.312.1	29.46.750.1	29.61.750.1	30.89.467.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*250	79.00.115.1			
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*300	79.00.121.1			
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*350	79.00.217.1	30.72.482.1	30.73.482.1	30.89.554.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	450* 50	79.01.749.1			
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 80	79.01.761.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450*100	79.00.303.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*150	79.00.313.1			
100* 50	79.01.062.1				450*200	79.00.109.1	30.72.509.1	30.73.509.1	
100* 80	79.01.086.1				450*250	79.00.116.1	30.72.532.1	30.73.532.1	
150* 50	79.01.064.1				450*300	79.00.122.1	30.72.562.1	30.73.562.1	
150* 80	79.01.088.1				450*350	79.00.218.1	30.72.581.1	30.73.581.1	30.89.650.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.228.1	30.72.611.1	30.73.611.1	30.89.674.1
200* 50	79.01.263.1				500* 50	79.01.750.1			
200* 80	79.01.275.1				500* 80	79.01.762.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.304.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.314.1			
250* 50	79.01.264.1				500*200	79.00.110.1	29.46.909.1	29.61.909.1	
250* 80	79.01.276.1				500*250	79.00.117.1	30.72.639.1	30.73.639.1	
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.123.1	30.72.652.1	30.73.652.1	
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.219.1	30.72.671.1	30.73.671.1	30.89.770.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.229.1	30.72.701.1	30.73.701.1	30.89.794.1
300* 50	79.01.265.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.01.277.1				600* 50	79.01.751.1			
300*100	79.00.392.1				600* 80	79.01.763.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.306.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.316.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.111.1			
350* 50	79.01.747.1				600*250	79.00.118.1	30.72.809.1	30.73.809.1	
350* 80	79.01.759.1				600*300	79.00.124.1	30.72.829.1	30.73.829.1	
350*100	79.00.301.1				600*350	79.00.220.1	30.72.841.1	30.73.841.1	30.89.890.1
350*150	79.00.311.1	29.46.600.1	29.61.600.1	30.89.377.1	600*400	79.00.230.1	30.72.881.1	30.73.881.1	30.89.914.1
350*250	79.00.114.1				600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*300	79.00.120.1				600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	021.1	016.1
20	40-600	023.1	018.1
25	40-100	025.1	020.1
	150-600	026.1	024.1
40	50-100	030.1	026.1
	150-600	031.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.59.042.1			230 76.83.37.101.1
813	76.80.59.044.1			255 76.83.37.102.1
1219	76.80.59.046.1			305 76.83.37.103.1
1524	76.80.59.048.1			355 76.83.37.105.1
1829	76.80.59.050.1			405 76.83.37.106.1
2134	76.80.59.052.1			455 76.83.37.107.1
2438	76.80.59.054.1			
2743	76.80.59.056.1			
3048	76.80.59.058.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.12.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.12.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.12.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 11373

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	19.6	19.2	18.4	17.6	16.7	15.8	14.8	11.0
DN100-150	19.6	19.2	18.4	17.6	16.7	15.8	14.8	9.0
DN200-600	19.6	19.2	18.4	17.6	16.7	15.8	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	A					50	80
300	C	C	C	C	E	E	E	E	E	E	A						80	80
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	20
40	C	B	B	A													400	20
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 11373	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 11373, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
ST3B	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

11373, REV.B PAGE 3

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																	
PIPE	74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	149.1	211.1	241.1	283.1	325.1	373.1	421.1	469.1	521.1	569.1
* FLANGES																	
BLIND FLANGE	76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
SPECTACLE BLIND FLANGE	76.88.03	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1
WELDING NECK FLANGE	76.62.78	402.1	404.1	406.1	408.1	360.1	362.1	314.1	316.1	258.1	260.1	262.1	214.1	216.1	218.1	220.1	224.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	095.1	115.1	133.1	153.1	173.1	192.1	212.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	645.1	665.1	683.1	703.1	723.1	742.1	762.1	782.1	805.1	825.1
* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED	77.20.04								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED	77.30.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN	76.65.96	252.1	254.1	256.1	258.1												
ORIFICE FLANGE SET	76.62.95					760.1	762.1	564.1	566.1	508.1	510.1	512.1	474.1	476.1	478.1	480.1	484.1
STRAINER Y-TYPE	76.83.19					426.1	428.1	443.1	444.1	445.1	446.1	447.1	448.1	449.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.748.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.760.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.00.302.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.00.312.1	29.46.750.1	29.61.750.1	30.89.467.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*250	79.00.115.1			
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*300	79.00.121.1			
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*350	79.00.217.1	30.72.482.1	30.73.482.1	30.89.554.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	450* 50	79.01.749.1			
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 80	79.01.761.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450*100	79.00.303.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*150	79.00.313.1			
100* 50	79.01.062.1				450*200	79.00.109.1	30.72.509.1	30.73.509.1	
100* 80	79.01.086.1				450*250	79.00.116.1	30.72.532.1	30.73.532.1	
150* 50	79.01.064.1				450*300	79.00.122.1	30.72.562.1	30.73.562.1	
150* 80	79.01.088.1				450*350	79.00.218.1	30.72.581.1	30.73.581.1	30.89.650.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.228.1	30.72.611.1	30.73.611.1	30.89.674.1
200* 50	79.01.263.1				500* 50	79.01.750.1			
200* 80	79.01.275.1				500* 80	79.01.762.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.304.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.314.1			
250* 50	79.01.264.1				500*200	79.00.110.1	29.46.909.1	29.61.909.1	
250* 80	79.01.276.1				500*250	79.00.117.1	30.72.639.1	30.73.639.1	
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.123.1	30.72.652.1	30.73.652.1	
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.219.1	30.72.671.1	30.73.671.1	30.89.770.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.229.1	30.72.701.1	30.73.701.1	30.89.794.1
300* 50	79.01.265.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.01.277.1				600* 50	79.01.751.1			
300*100	79.00.392.1				600* 80	79.01.763.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.306.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.316.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.111.1			
350* 50	79.01.747.1				600*250	79.00.118.1	30.72.809.1	30.73.809.1	
350* 80	79.01.759.1				600*300	79.00.124.1	30.72.829.1	30.73.829.1	
350*100	79.00.301.1				600*350	79.00.220.1	30.72.841.1	30.73.841.1	30.89.890.1
350*150	79.00.311.1	29.46.600.1	29.61.600.1	30.89.377.1	600*400	79.00.230.1	30.72.881.1	30.73.881.1	30.89.914.1
350*250	79.00.114.1				600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*300	79.00.120.1				600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	021.1	016.1
20	40-600	023.1	018.1
25	40-100	025.1	020.1
	150-600	026.1	024.1
40	50-100	030.1	026.1
	150-600	031.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.042.1			230 76.83.37.101.1
813	76.80.60.044.1			255 76.83.37.102.1
1219	76.80.60.046.1			305 76.83.37.103.1
1524	76.80.60.048.1			355 76.83.37.105.1
1829	76.80.60.050.1			405 76.83.37.106.1
2134	76.80.60.052.1			455 76.83.37.107.1
2438	76.80.60.054.1			
2743	76.80.60.056.1			
3048	76.80.60.058.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.004.1	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.058.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.30.05.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.62.78.402.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.404.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.062.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.30.05.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 12040

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450
-----	-----									
	PRESSURE BAR GA									
DN15 -600	19.9	19.5	17.6	15.8	13.9	12.0	10.2	8.3	6.5	4.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.13
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600
-----	-----														
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A
450	C	C	C	C	E	D	D	D	E	E	E	E	E	A	
400	C	C	C	C	D	D	D	D	D	D	D	D	A		
350	C	C	C	C	D	D	D	D	D	D	D	A			
300	C	C	C	C	D	D	D	D	D	D	A				
250	C	C	C	C	D	D	D	D	D	A					
200	C	C	C	C	D	D	D	D	A						
150	C	C	C	C	D	D	D	A							
100	C	C	C	C	D	D	A								
80	C	C	C	C	D	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
15	80
20	80
25	80
40	80
50	40
80	40
100	40
150	40
200	20
250	20
300	20
350	20
400	20
450	20
500	20
600	20

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (5CR-0.5MO)	PLANT :	
CLASS NO. : 12040	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	
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ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 12040, REV.C PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P5
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-5CR CLASS 22
		DN 15- 40	ASTM A335-P5

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F5
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F5
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F5
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-5
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-5
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F5

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP5
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F5
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F5
BR0B	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F5
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP5
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP5
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP5

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A335-P5
MTRR	METER RUN	DN 15- 40	ASTM A182-F5/A335-P5
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F5
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.01	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	093.1	105.1	117.1	129.1	139.1	449.1	459.1	479.1
PIPE NIPPLE 50MM		76.32.57	231.1	241.1	251.1	271.1												
* FLANGES																		
BLIND FLANGE		76.64.11	008.1	012.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	040.1	044.1
SPECTACLE BLIND FLANGE		76.88.08	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	190.1	194.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	608.1	612.1	616.1	618.1	620.1	622.1	624.1	626.1	628.1	630.1	632.1	634.1	636.1	638.1	640.1	644.1
WELDING NECK FLANGE		76.64.80	086.1	090.1	094.1	098.1	050.1	052.1	054.1	056.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	034.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	170.1	176.1	180.1	187.1	205.1	225.1	245.1	265.1	283.1	293.1	303.1	313.1	323.1	333.1	343.1	353.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	170.1	176.1	180.1	187.1	205.1	225.1	245.1	265.1	283.1	293.1	303.1	313.1	323.1	333.1	343.1	353.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	657.1	667.1	677.1	687.1	705.1	725.1	745.1	765.1	783.1	803.1	813.1	823.1	833.1	843.1	853.1	863.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	170.1	176.1	180.1	187.1	205.1	225.1	245.1	265.1	283.1	293.1	303.1	313.1	323.1	333.1	343.1	353.1
* VALVES																		
CHECK VALVE FLANGED		77.13.50	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.23.50	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.33.50	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	304.1	306.1	308.1	312.1	314.1	318.1	320.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	342.1
METER RUN		76.64.95	202.1	204.1	206.1	208.1												
ORIFICE FLANGE SET		76.64.92					220.1	222.1	224.1	226.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1
STRAINER Y-TYPE		76.83.20					102.1	104.1	106.1	108.1	109.1	111.1	113.1	115.1	117.1			

RUN* BR	BROB	RECB	REEB	TERB				BROB	RECB	REEB
	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.
20* 15		32.66.002.1	32.67.002.1	32.85.520.1	400* 50	79.40.269.1				
25* 15		32.66.012.1	32.67.012.1	32.85.530.1	400* 80	79.40.277.1				
25* 20		32.66.022.1	32.67.022.1	32.85.540.1	400*100	79.40.287.1				
40* 15		32.66.032.1	32.67.032.1		400*150	79.40.297.1	32.66.346.1	32.67.346.1		
40* 20		32.66.042.1	32.67.042.1		400*200	79.40.199.1	32.66.349.1	32.67.349.1		
40* 25		32.66.052.1	32.67.052.1		400*250	79.40.209.1	32.66.359.1	32.67.359.1		
50* 20		32.66.069.1	32.67.069.1		400*300	79.40.219.1	32.66.369.1	32.67.369.1		
50* 25		32.66.075.1	32.67.075.1		400*350	79.40.229.1	32.66.379.1	32.67.379.1		
50* 40		32.66.085.1	32.67.085.1		450* 50	79.40.270.1				
80* 40		32.66.095.1	32.67.095.1		450* 80	79.40.278.1				
80* 50	79.40.810.1	32.66.101.1	32.67.101.1		450*100	79.40.288.1				
100* 40		32.66.119.1	32.67.119.1		450*150	79.40.298.1				
100* 50	79.40.812.1	32.66.125.1	32.67.125.1		450*200	79.40.200.1	32.66.386.1	32.67.386.1		
100* 80	79.40.836.1	32.66.140.1	32.67.140.1		450*250	79.40.210.1	32.66.389.1	32.67.389.1		
150* 50	79.40.814.1				450*300	79.40.220.1	32.66.399.1	32.67.399.1		
150* 80	79.40.838.1	32.66.155.1	32.67.155.1		450*350	79.40.230.1	32.66.409.1	32.67.409.1		
150*100	79.40.860.1	32.66.170.1	32.67.170.1		450*400	79.40.240.1	32.66.419.1	32.67.419.1		
200* 50	79.40.265.1				500* 50	79.40.271.1				
200* 80	79.40.272.1				500* 80	79.40.279.1				
200*100	79.40.283.1	32.66.195.1	32.67.195.1		500*100	79.40.289.1				
200*150	79.40.293.1	32.66.220.1	32.67.220.1		500*150	79.40.299.1				
250* 50	79.40.266.1				500*200	79.40.201.1	32.66.428.1	32.67.428.1		
250* 80	79.40.273.1				500*250	79.40.211.1	32.66.437.1	32.67.437.1		
250*100	79.40.284.1	32.66.250.1	32.67.250.1		500*300	79.40.221.1	32.66.430.1	32.67.430.1		
250*150	79.40.294.1	32.66.260.1	32.67.260.1		500*350	79.40.231.1	32.66.440.1	32.67.440.1		
250*200	79.40.196.1	32.66.269.1	32.67.269.1		500*400	79.40.241.1	32.66.450.1	32.67.450.1		
300* 50	79.40.267.1				500*450	79.40.250.1	32.66.460.1	32.67.460.1		
300* 80	79.40.275.1				600* 50	79.40.274.1				
300*100	79.40.285.1				600* 80	79.40.280.1				
300*150	79.40.295.1	32.66.284.1	32.67.284.1		600*100	79.40.290.1				
300*200	79.40.197.1	32.66.289.1	32.67.289.1		600*150	79.40.300.1				
300*250	79.40.207.1	32.66.299.1	32.67.299.1		600*200	79.40.202.1				
350* 50	79.40.268.1				600*250	79.40.212.1	32.66.464.1	32.67.464.1		
350* 80	79.40.276.1				600*300	79.40.222.1	32.66.467.1	32.67.467.1		
350*100	79.40.286.1				600*350	79.40.232.1	32.66.484.1	32.67.484.1		
350*150	79.40.296.1	32.66.314.1	32.67.314.1		600*400	79.40.242.1	32.66.470.1	32.67.470.1		
350*200	79.40.198.1	32.66.319.1	32.67.319.1		600*450	79.40.254.1	32.66.480.1	32.67.480.1		
350*250	79.40.208.1	32.66.329.1	32.67.329.1		600*500	79.40.260.1	32.66.490.1	32.67.490.1		
350*300	79.40.218.1	32.66.339.1	32.67.339.1							

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.38	76.80.31
15	40-150	101.1	251.1
	200-600	102.1	252.1
20	40- 80	103.1	253.1
	100-600	104.1	254.1
25	40- 40	105.1	255.1
	50- 50	106.1	256.1
	80-100	107.1	257.1
	150-600	108.1	258.1
40	50- 50	110.1	259.1
	80- 80	111.1	260.1
	100-100	112.1	261.1
	150-300	113.1	263.1
	350-600	114.1	264.1

LEVEL	DISPLACER	CHAMBER	THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.742.1		230	76.83.37.101.1
813	76.80.60.744.1		255	76.83.37.102.1
1219	76.80.60.746.1		305	76.83.37.103.1
1524	76.80.60.748.1		355	76.83.37.105.1
1829	76.80.60.750.1		405	76.83.37.106.1
2134	76.80.60.752.1		455	76.83.37.107.1
2438	76.80.60.754.1			
2743	76.80.60.756.1			
3048	76.80.60.758.1			

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.008.1	
GASKET, SPIRAL WOUND	2	85.41.46.304.1	
GATE VALVE FLANGED	1	77.23.50.003.1	
STUD BOLT WITH NUTS	8	81.38.96.153.1	
WELDING NECK FLANGE	1	76.64.80.086.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.012.1	
GASKET, SPIRAL WOUND	2	85.41.46.306.1	
GATE VALVE FLANGED	1	77.23.50.004.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.80.090.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.012.1	
GASKET, SPIRAL WOUND	2	85.41.46.306.1	
GATE VALVE FLANGED	1	77.23.50.004.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.304.1	
GATE VALVE FLANGED	2	77.23.50.003.1	
LAP-JOINT FLANGE	2	76.64.20.408.1	
STUD BOLT WITH NUTS	8	81.38.96.153.1	
	8	81.38.96.155.1	
WELDING NECK FLANGE	2	76.64.80.086.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.304.1	
GATE VALVE FLANGED	1	77.23.50.003.1	
LAP-JOINT FLANGE	1	76.64.20.408.1	
STUD BOLT WITH NUTS	4	81.38.96.153.1	
	4	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.80.086.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.304.1	
GATE VALVE FLANGED	1	77.23.50.003.1	
LAP-JOINT FLANGE	1	76.64.20.408.1	
STUD BOLT WITH NUTS	4	81.38.96.153.1	
	4	81.38.96.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.304.1	
GATE VALVE FLANGED	2	77.23.50.003.1	
LAP-JOINT FLANGE	2	76.64.20.408.1	
STUD BOLT WITH NUTS	8	81.38.96.153.1	
	8	81.38.96.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.581.1	
GASKET, SPIRAL WOUND	1	85.41.46.312.1	
STUD BOLT WITH NUTS	4	81.38.96.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.581.1	
GASKET, SPIRAL WOUND	1	85.41.46.312.1	
STUD BOLT WITH NUTS	4	81.38.96.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.008.1	
GASKET, SPIRAL WOUND	2	85.41.46.304.1	
GLOBE VALVE FLANGED	1	77.33.50.003.1	
STUD BOLT WITH NUTS	8	81.38.96.153.1	
WELDING NECK FLANGE	1	76.64.80.086.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.012.1	
GASKET, SPIRAL WOUND	2	85.41.46.306.1	
GLOBE VALVE FLANGED	1	77.33.50.004.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.80.090.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.012.1	
GASKET, SPIRAL WOUND	2	85.41.46.306.1	
GLOBE VALVE FLANGED	1	77.33.50.004.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	

CLASS 12080

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450
-----	-----									
	PRESSURE BAR GA									
DN15 -600	18.2	18.1	17.6	15.8	13.9	12.0	10.2	8.3	6.5	4.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.5
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600
-----	-----														
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A
500	C	C	C	C	D	D	D	D	D	D	D	D	D	D	A
450	C	C	C	C	E	D	D	D	E	E	E	E	E	A	
400	C	C	C	C	D	D	D	D	D	D	D	D	A		
350	C	C	C	C	D	D	D	D	D	D	D	A			
300	C	C	C	C	D	D	D	D	D	D	A				
250	C	C	C	C	D	D	D	D	D	A					
200	C	C	C	C	D	D	D	D	A						
150	C	C	C	C	D	D	D	A							
100	C	C	C	C	D	D	A								
80	C	C	C	C	D	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
15	80
20	80
25	80
40	80
50	40
80	40
100	40
150	40
200	20
250	20
300	20
350	20
400	20
450	20
500	20
600	20

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (0.5MO)	PLANT :	
CLASS NO. : 12080	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	
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ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 12080, REV.C PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P1
		DN450-600	ASTM A672-L70 CLASS 22
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A335-P1

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F1
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F1
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F1
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A204-A/B
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A204-A/B
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F1

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP1
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP1
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP1
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP1

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F1
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F1
BR0B	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F1
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP1
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP1
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP1

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A204-A/B
MTRR	METER RUN	DN 15- 40	ASTM A182-F1/A335-P1
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F1
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.06	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	093.1	105.1	117.1	129.1	139.1	749.1	759.1	779.1
PIPE NIPPLE 50MM		76.32.57	031.1	041.1	051.1	071.1												
* FLANGES																		
BLIND FLANGE		76.64.09	008.1	012.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	040.1	044.1
SPECTACLE BLIND FLANGE		76.88.05	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	190.1	194.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	008.1	012.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	040.1	044.1
WELDING NECK FLANGE		76.64.78	086.1	090.1	094.1	098.1	050.1	052.1	054.1	056.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	034.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	710.1	715.1	719.1	727.1	735.1	745.1	755.1	765.1	773.1	783.1	793.1	803.1	813.1	823.1	833.1	853.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.37	210.1	215.1	219.1	227.1	235.1	245.1	255.1	265.1	273.1	283.1	293.1	303.1	313.1	323.1	333.1	353.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.41	677.1	687.1	697.1	707.1	715.1	725.1	735.1	745.1	753.1	763.1	773.1	783.1	793.1	803.1	813.1	833.1
EQUAL TEE BUTT-WELD ENDS		76.32.83	210.1	215.1	219.1	227.1	235.1	245.1	255.1	265.1	273.1	283.1	293.1	303.1	313.1	323.1	333.1	353.1
* VALVES																		
CHECK VALVE FLANGED		77.13.60	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.23.60	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.33.60	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.64.95	002.1	004.1	006.1	008.1												
ORIFICE FLANGE SET		76.64.90					154.1	156.1	158.1	160.1	112.1	114.1	116.1	118.1	120.1	122.1	124.1	126.1
STRAINER Y-TYPE		76.83.20					002.1	004.1	006.1	008.1	009.1	011.1	013.1	015.1	017.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB
	76.	76.	76.	76.		76.	76.	76.
RUN* BR	.							
20* 15		32.64.002.1	32.65.002.1	32.85.620.1	400* 50	79.20.399.1		
25* 15		32.64.012.1	32.65.012.1	32.85.630.1	400* 80	79.20.417.1		
25* 20		32.64.022.1	32.65.022.1	32.85.640.1	400*100	79.20.427.1		
40* 15		32.64.032.1	32.65.032.1		400*150	79.20.437.1	32.64.346.1	32.65.346.1
40* 20		32.64.042.1	32.65.042.1		400*200	79.20.199.1	32.64.349.1	32.65.349.1
40* 25		32.64.052.1	32.65.052.1		400*250	79.20.219.1	32.64.359.1	32.65.359.1
50* 20		32.64.069.1	32.65.069.1		400*300	79.20.229.1	32.64.369.1	32.65.369.1
50* 25		32.64.075.1	32.65.075.1		400*350	79.20.239.1	32.64.379.1	32.65.379.1
50* 40		32.64.085.1	32.65.085.1		450* 50	79.20.204.1		
80* 40		32.64.095.1	32.65.095.1		450* 80	79.20.418.1		
80* 50	79.20.810.1	32.64.101.1	32.65.101.1		450*100	79.20.428.1		
100* 40		32.64.119.1	32.65.119.1		450*150	79.20.438.1		
100* 50	79.20.812.1	32.64.125.1	32.65.125.1		450*200	79.20.200.1	32.64.386.1	32.65.386.1
100* 80	79.20.836.1	32.64.140.1	32.65.140.1		450*250	79.20.220.1	32.64.389.1	32.65.389.1
150* 50	79.20.814.1				450*300	79.20.230.1	32.64.399.1	32.65.399.1
150* 80	79.20.838.1	32.64.155.1	32.65.155.1		450*350	79.20.240.1	32.64.409.1	32.65.409.1
150*100	79.20.860.1	32.64.170.1	32.65.170.1		450*400	79.20.250.1	32.64.419.1	32.65.419.1
200* 50	79.20.395.1				500* 50	79.20.401.1		
200* 80	79.20.413.1				500* 80	79.20.419.1		
200*100	79.20.423.1	32.64.195.1	32.65.195.1		500*100	79.20.429.1		
200*150	79.20.433.1	32.64.220.1	32.65.220.1		500*150	79.20.439.1		
250* 50	79.20.396.1				500*200	79.20.201.1	32.64.428.1	32.65.428.1
250* 80	79.20.414.1				500*250	79.20.221.1	32.64.437.1	32.65.437.1
250*100	79.20.424.1	32.64.250.1	32.65.250.1		500*300	79.20.231.1	32.64.430.1	32.65.430.1
250*150	79.20.434.1	32.64.260.1	32.65.260.1		500*350	79.20.241.1	32.64.440.1	32.65.440.1
250*200	79.20.196.1	32.64.269.1	32.65.269.1		500*400	79.20.251.1	32.64.450.1	32.65.450.1
300* 50	79.20.397.1				500*450	79.20.259.1	32.64.460.1	32.65.460.1
300* 80	79.20.415.1				600* 50	79.20.440.1		
300*100	79.20.425.1				600* 80	79.20.420.1		
300*150	79.20.435.1	32.64.284.1	32.65.284.1		600*100	79.20.222.1		
300*200	79.20.197.1	32.64.289.1	32.65.289.1		600*150	79.20.232.1		
300*250	79.20.217.1	32.64.299.1	32.65.299.1		600*200	79.20.242.1		
350* 50	79.20.398.1				600*250	79.20.252.1	32.64.464.1	32.65.464.1
350* 80	79.20.416.1				600*300	79.20.260.1	32.64.467.1	32.65.467.1
350*100	79.20.426.1				600*350	79.20.270.1	32.64.484.1	32.65.484.1
350*150	79.20.436.1	32.64.314.1	32.65.314.1		600*400	79.20.400.1	32.64.470.1	32.65.470.1
350*200	79.20.198.1	32.64.319.1	32.65.319.1		600*450	79.20.430.1	32.64.480.1	32.65.480.1
350*250	79.20.218.1	32.64.329.1	32.65.329.1		600*500	79.20.402.1	32.64.490.1	32.65.490.1
350*300	79.20.228.1	32.64.339.1	32.65.339.1					

		BNIF	BNIP
		76.80.38	76.80.31
BRANCH	RUN-PIPE		
15	40-150	001.1	151.1
	200-600	002.1	152.1
20	40- 80	003.1	153.1
	100-600	004.1	154.1
25	40- 40	005.1	155.1
	50- 50	006.1	156.1
	80-100	007.1	157.1
	150-600	008.1	158.1
40	50- 50	010.1	159.1
	80- 80	011.1	160.1
	100-100	012.1	161.1
	150-300	013.1	163.1
	350-600	014.1	164.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.702.1			230 76.83.37.101.1
813	76.80.60.704.1			255 76.83.37.102.1
1219	76.80.60.706.1			305 76.83.37.103.1
1524	76.80.60.708.1			355 76.83.37.105.1
1829	76.80.60.710.1			405 76.83.37.106.1
2134	76.80.60.712.1			455 76.83.37.107.1
2438	76.80.60.714.1			
2743	76.80.60.716.1			
3048	76.80.60.718.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 60	15	4	1/2	* 70
20	4	1/2	* 70	20	4	1/2	* 70
25	4	1/2	* 70	25	4	1/2	* 80
40	4	1/2	* 80	40	4	1/2	* 80
50	4	5/8	* 80				
80	4	5/8	* 100				
100	8	5/8	* 100				
150	8	3/4	* 100				
200	8	3/4	* 110				
250	12	7/8	* 120				
300	12	7/8	* 120				
350	12	1	* 130				
400	16	1	* 140				
450	16	1 1/8	* 150				
500	20	1 1/8	* 160				
600	20	1 1/4	* 180				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 70
				20	4	1/2	* 70
				25	4	1/2	* 80
				40	4	1/2	* 80
50	8	5/8	* 150	50	4	5/8	* 90
80	8	3/4	* 150	80	4	5/8	* 110
100	12	3/4	* 140	100	8	5/8	* 110
150	12	3/4	* 140	150	8	3/4	* 120
200	12	7/8	* 150	200	8	3/4	* 130
250	16	1	* 170	250	12	7/8	* 140
300	16	1 1/8	* 190	300	12	7/8	* 150
350	20	1 1/8	* 200	350	12	1	* 160
400	20	1 1/4	* 210	400	16	1	* 170
450	24	1 1/4	* 220	450	16	1 1/8	* 180
500	24	1 1/4	* 230	500	20	1 1/8	* 200
600	24	1 1/2	* 260	600	20	1 1/4	* 220

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.09.008.1
GASKET, RF TANGED INSERT 2 85.30.01.004.1
GATE VALVE FLANGED 1 77.23.60.003.1
STUD BOLT WITH NUTS 8 81.38.96.153.1
WELDING NECK FLANGE 1 76.64.78.086.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.09.012.1
GASKET, RF TANGED INSERT 2 85.30.01.006.1
GATE VALVE FLANGED 1 77.23.60.004.1
STUD BOLT WITH NUTS 8 81.38.96.155.1
WELDING NECK FLANGE 1 76.64.78.090.1

* DRAIN POINT DN 20 FIG.0H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.09.012.1
GASKET, RF TANGED INSERT 2 85.30.01.006.1
GATE VALVE FLANGED 1 77.23.60.004.1
STUD BOLT WITH NUTS 8 81.38.96.155.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.004.1
GATE VALVE FLANGED 2 77.23.60.003.1
LAP-JOINT FLANGE 2 76.64.20.708.1
STUD BOLT WITH NUTS 8 81.38.96.153.1
WELDING NECK FLANGE 2 76.64.78.086.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.004.1
GATE VALVE FLANGED 1 77.23.60.003.1
LAP-JOINT FLANGE 1 76.64.20.708.1
STUD BOLT WITH NUTS 4 81.38.96.153.1
WELDING NECK FLANGE 1 76.64.78.086.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.004.1
GATE VALVE FLANGED 1 77.23.60.003.1
LAP-JOINT FLANGE 1 76.64.20.708.1
STUD BOLT WITH NUTS 4 81.38.96.153.1
WELDING NECK FLANGE 4 81.38.96.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.004.1
GATE VALVE FLANGED 2 77.23.60.003.1
LAP-JOINT FLANGE 2 76.64.20.708.1
STUD BOLT WITH NUTS 8 81.38.96.153.1
WELDING NECK FLANGE 8 81.38.96.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.64.60.931.1
GASKET, RF TANGED INSERT 1 85.30.01.012.1
STUD BOLT WITH NUTS 4 81.38.96.159.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.64.60.931.1
GASKET, RF TANGED INSERT 1 85.30.01.012.1
STUD BOLT WITH NUTS 4 81.38.96.159.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.09.008.1
GASKET, RF TANGED INSERT 2 85.30.01.004.1
GLOBE VALVE FLANGED 1 77.33.60.003.1
STUD BOLT WITH NUTS 8 81.38.96.153.1
WELDING NECK FLANGE 1 76.64.78.086.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.09.012.1
GASKET, RF TANGED INSERT 2 85.30.01.006.1
GLOBE VALVE FLANGED 1 77.33.60.004.1
STUD BOLT WITH NUTS 8 81.38.96.155.1
WELDING NECK FLANGE 1 76.64.78.090.1

* VENT POINT DN 20 FIG.1H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.09.012.1
GASKET, RF TANGED INSERT 2 85.30.01.006.1
GLOBE VALVE FLANGED 1 77.33.60.004.1
STUD BOLT WITH NUTS 8 81.38.96.155.1

CLASS 13011

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	18.9	18.5	16.7	15.8	13.9	12.0	10.2	8.3	6.5

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	40S
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	40S
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	10S
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	10S
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	10S
300	C	C	C	C	D	E	E	E	E	E	E	A					80	10S
250	C	C	C	C	D	D	D	D	D	A							100	10S
200	C	C	C	C	D	D	D	D	D	A							150	10S
150	C	C	C	C	D	D	D	D	A								200	10S
100	C	C	C	C	D	D	A										250	10S
80	C	C	C	C	D	A											300	10S
50	C	C	C	C	B	A											350	10S
40	C	B	B	A													400	10S
25	B	B	A														450	10S
20	B	A															500	10S
15	A																600	10S

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 321/347	PLANT :	
CLASS NO. : 13011	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 13011, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321/347
		DN350-600	ASTM A358-321/347
PNPP	PIPE NIPPLE 50MM	DN 15- 20	ASTM A312-TP321/347

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F321/347
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240-TP321/347
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240-TP321/347
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F321/347

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A403-WP321/347
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP321/347
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP321/347
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A403-WP321/347

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321/347
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321/347
BR0B	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F321/347
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A403-WP321/347
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A403-WP321/347
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP321/347

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321/347
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: AISI 321/347 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 321/347 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 321/347
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F321/347
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 13011, REV.B PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.36.15	018.1	026.1	033.1	049.1	057.1	065.1	073.1	082.1	091.1	103.1	115.1					
		74.36.18												127.1	137.1	147.1	157.1	178.1
PIPE NIPPLE 50MM		76.33.57	231.1	241.1	249.1	268.1												
* FLANGES																		
BLIND FLANGE		76.65.10	012.1	014.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	040.1	042.1
SPECTACLE BLIND FLANGE		76.88.09	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	190.1	194.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	708.1	712.1	716.1	718.1	720.1	722.1	724.1	726.1	728.1	730.1	732.1	734.1	736.1	738.1	740.1	744.1
WELDING NECK FLANGE		76.65.78	522.1	524.1	406.1	408.1	410.1	412.1	414.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1
* FITTINGS																		
CAP BUTT-WELD.END		76.33.18	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	154.1	167.1	183.1	198.1	207.1	218.1	229.1	250.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.38	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	154.1	167.1	183.1	198.1	207.1	218.1	229.1	250.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.39	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1	698.1	707.1	718.1	729.1	750.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	154.1	167.1	183.1	198.1	207.1	218.1	229.1	250.1
* VALVES																		
CHECK VALVE FLANGED		77.13.20	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.23.20	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.33.20	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	802.1	804.1	806.1	808.1												
ORIFICE FLANGE SET		76.65.95					270.1	272.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1
STRAINER Y-TYPE		76.83.21					202.1	204.1	206.1	208.1	211.1	212.1	214.1	216.1	218.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB
	76.	76.	76.	76.		76.	76.	76.
RUN* BR	-----							
20* 15		33.69.066.1	33.71.066.1	33.85.018.1	400* 50	79.72.374.1		
25* 15		33.69.079.1	33.71.079.1	33.85.032.1	400* 80	79.72.398.1		
25* 20		33.69.089.1	33.71.089.1	33.85.037.1	400*100	79.72.420.1		
40* 15		33.69.099.1	33.71.099.1		400*150	79.72.440.1	33.69.371.1	33.71.371.1
40* 20		33.69.119.1	33.71.119.1	33.85.032.1	400*200	79.72.458.1	33.69.373.1	33.71.373.1
40* 25		33.69.124.1	33.71.124.1	33.85.056.1	400*250	79.72.474.1	33.69.376.1	33.71.376.1
50* 20		33.69.132.1	33.71.132.1		400*300	79.72.488.1	33.69.378.1	33.71.378.1
50* 25		33.69.134.1	33.71.134.1		400*350	79.72.500.1	33.69.392.1	33.71.392.1
50* 40		33.69.144.1	33.71.144.1	33.85.083.1	450* 50	79.72.376.1		
80* 40		33.69.174.1	33.71.174.1		450* 80	79.72.400.1		
80* 50	79.72.360.1	33.69.184.1	33.71.184.1		450*100	79.72.422.1		
100* 40		33.69.190.1	33.71.190.1		450*150	79.72.442.1		
100* 50	79.72.362.1	33.69.204.1	33.71.204.1		450*200	79.72.460.1	33.69.375.1	33.71.375.1
100* 80	79.72.386.1	33.69.214.1	33.71.214.1		450*250	79.72.476.1	33.69.400.1	33.71.400.1
150* 50	79.72.364.1				450*300	79.72.490.1	33.69.401.1	33.71.401.1
150* 80	79.72.388.1	33.69.244.1	33.71.244.1		450*350	79.72.502.1	33.69.403.1	33.71.403.1
150*100	79.72.410.1	33.69.254.1	33.71.254.1		450*400	79.72.512.1	33.69.414.1	33.71.414.1
200* 50	79.72.366.1				500* 50	79.72.378.1		
200* 80	79.72.390.1				500* 80	79.72.402.1		
200*100	79.72.412.1	33.69.264.1	33.71.264.1		500*100	79.72.424.1		
200*150	79.72.432.1	33.69.274.1	33.71.274.1		500*150	79.72.444.1		
250* 50	79.72.368.1				500*200	79.72.462.1	33.69.421.1	33.71.421.1
250* 80	79.72.392.1				500*250	79.72.478.1	33.69.422.1	33.71.422.1
250*100	79.72.414.1	33.69.284.1	33.71.284.1		500*300	79.72.492.1	33.69.420.1	33.71.420.1
250*150	79.72.434.1	33.69.289.1	33.71.289.1		500*350	79.72.504.1	33.69.423.1	33.71.423.1
250*200	79.72.452.1	33.69.303.1	33.71.303.1		500*400	79.72.514.1	33.69.425.1	33.71.425.1
300* 50	79.72.370.1				500*450	79.72.522.1	33.69.435.1	33.71.435.1
300* 80	79.72.394.1				600* 50	79.72.382.1		
300*100	79.72.416.1				600* 80	79.72.406.1		
300*150	79.72.436.1	33.69.316.1	33.71.316.1		600*100	79.72.428.1		
300*200	79.72.454.1	33.69.327.1	33.71.327.1		600*150	79.72.448.1		
300*250	79.72.470.1	33.69.339.1	33.71.339.1		600*200	79.72.466.1		
350* 50	79.72.372.1				600*250	79.72.482.1	33.69.440.1	33.71.440.1
350* 80	79.72.396.1				600*300	79.72.496.1	33.69.441.1	33.71.441.1
350*100	79.72.418.1				600*350	79.72.508.1	33.69.443.1	33.71.443.1
350*150	79.72.438.1	33.69.347.1	33.71.347.1		600*400	79.72.518.1	33.69.445.1	33.71.445.1
350*200	79.72.456.1	33.69.349.1	33.71.349.1		600*450	79.72.526.1	33.69.465.1	33.71.465.1
350*250	79.72.472.1	33.69.351.1	33.71.351.1		600*500	79.72.532.1	33.69.475.1	33.71.475.1
350*300	79.72.486.1	33.69.363.1	33.71.363.1					

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	501.1	476.1
	200-600	502.1	477.1
20	40- 80	503.1	478.1
	100-600	504.1	479.1
25	40- 40	525.1	490.1
	50- 50	526.1	491.1
	80-100	527.1	492.1
	150-600	528.1	493.1
40	50- 50	530.1	494.1
	80- 80	531.1	495.1
	100-100	532.1	496.1
	150-300	533.1	497.1
	350-600	534.1	498.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450	76.81.70.152.1
840	76.81.70.154.1
1230	76.81.70.156.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356	76.80.61.842.1
813	76.80.61.844.1
1219	76.80.61.846.1
1524	76.80.61.848.1
1829	76.80.61.850.1
2134	76.80.61.852.1
2438	76.80.61.854.1
2743	76.80.61.856.1
3048	76.80.61.858.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.012.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.23.20.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.65.78.522.1	

* DRAIN POINT	DN 20	FIG.0I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.014.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.23.20.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.78.524.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.014.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.23.20.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.23.20.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.65.78.522.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.23.20.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.78.522.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.23.20.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.23.20.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.012.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.33.20.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.65.78.522.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.014.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.33.20.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.78.524.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.014.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.33.20.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 13021

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400
-----	-----								
	PRESSURE BAR GA								
DN15 -600	18.9	18.4	16.3	14.7	13.5	12.0	10.2	8.3	6.5

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 40S
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 40S
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 10S
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 10S
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 10S
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 10S
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 10S
200	C	C	C	C	D	D	E	E	E	E	E	E	E	E	E	A	150 10S
150	C	C	C	C	D	D	D	D	A								200 10S
100	C	C	C	C	D	D	A										250 10S
80	C	C	C	C	D	A											300 10S
50	C	C	C	B	A												350 10S
40	C	B	B	A													400 10S
25	B	B	A														450 10S
20	B	A															500 10S
15	A																600 10S

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 316	PLANT :	
CLASS NO. : 13021	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 13021, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
		DN350-600	ASTM A358-316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BR0B	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP316
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWGS	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.36.33	018.1	026.1	033.1	049.1	057.1	065.1	073.1	082.1	091.1	103.1	115.1					
		74.36.34												127.1	137.1	147.1	157.1	177.1
PIPE NIPPLE 50MM		76.33.57	931.1	941.1	949.1	968.1												
* FLANGES																		
BLIND FLANGE		76.65.10	312.1	314.1	316.1	318.1	320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	342.1
SPECTACLE BLIND FLANGE		76.88.10	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	190.1	194.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	444.1
WELDING NECK FLANGE		76.65.79	262.1	264.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1
* FITTINGS																		
CAP BUTT-WELD.END		76.33.19	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	786.1	796.1	804.1	824.1	834.1	854.1	874.1	893.1	904.1	917.1	933.1	948.1	957.1	968.1	979.1	999.1
* VALVES																		
CHECK VALVE FLANGED		77.13.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.23.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.33.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	402.1	404.1	406.1	408.1												
ORIFICE FLANGE SET		76.65.92					470.1	472.1	264.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1
STRAINER Y-TYPE		76.83.21					402.1	404.1	406.1	409.1	411.1	412.1	415.1	416.1	419.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		33.70.566.1	33.72.566.1	33.85.618.1	400* 50	79.68.374.1			
25* 15		33.70.579.1	33.72.579.1	33.85.632.1	400* 80	79.68.398.1			
25* 20		33.70.589.1	33.72.589.1	33.85.637.1	400*100	79.68.420.1			
40* 15		33.70.599.1	33.72.599.1	33.85.643.1	400*150	79.68.440.1	36.50.620.1	36.63.620.1	33.89.466.1
40* 20		33.70.619.1	33.72.619.1	33.85.649.1	400*200	79.68.458.1	33.70.869.1	33.72.869.1	33.89.471.1
40* 25		33.70.624.1	33.72.624.1	33.85.656.1	400*250	79.68.474.1	33.70.873.1	33.72.873.1	33.89.476.1
50* 20		36.50.090.1	36.63.090.1	33.85.665.1	400*300	79.68.488.1	33.70.878.1	33.72.878.1	33.89.481.1
50* 25		33.70.634.1	33.72.634.1	33.85.673.1	400*350	79.68.500.1	33.70.892.1	33.72.892.1	33.89.486.1
50* 40		33.70.644.1	33.72.644.1	33.85.683.1	450* 50	79.68.376.1			
80* 40		33.70.674.1	33.72.674.1	33.85.693.1	450* 80	79.68.400.1			
80* 50	79.68.360.1	33.70.684.1	33.72.684.1	33.89.352.1	450*100	79.68.422.1			
100* 40		33.70.693.1	33.72.693.1	33.89.360.1	450*150	79.68.442.1			
100* 50	79.68.362.1	33.70.704.1	33.72.704.1	33.89.368.1	450*200	79.68.460.1	36.50.700.1	36.63.700.1	33.89.491.1
100* 80	79.68.386.1	33.70.714.1	33.72.714.1	33.89.376.1	450*250	79.68.476.1	36.48.714.1	33.72.897.1	33.89.496.1
150* 50	79.68.364.1				450*300	79.68.490.1	36.48.731.1	33.72.900.1	33.89.501.1
150* 80	79.68.388.1	33.70.744.1	33.72.744.1	33.89.384.1	450*350	79.68.502.1	36.48.748.1	33.72.903.1	33.89.506.1
150*100	79.68.410.1	33.70.754.1	33.72.754.1	33.89.392.1	450*400	79.68.512.1	36.48.765.1	33.72.914.1	33.89.511.1
200* 50	79.68.366.1				500* 50	79.68.378.1			
200* 80	79.68.390.1				500* 80	79.68.402.1			
200*100	79.68.412.1	33.70.764.1	33.72.764.1	33.89.400.1	500*100	79.68.424.1			
200*150	79.68.432.1	33.70.774.1	33.72.774.1	33.89.408.1	500*150	79.68.444.1			
250* 50	79.68.368.1				500*200	79.68.462.1	36.50.790.1	36.63.790.1	33.89.516.1
250* 80	79.68.392.1				500*250	79.68.478.1	36.50.810.1	36.63.810.1	33.89.521.1
250*100	79.68.414.1	36.50.250.1	36.63.250.1	33.89.416.1	500*300	79.68.492.1	36.48.816.1	33.72.920.1	33.89.526.1
250*150	79.68.434.1	33.70.789.1	33.72.789.1	33.89.421.1	500*350	79.68.504.1	36.48.833.1	33.72.923.1	33.89.531.1
250*200	79.68.452.1	33.70.803.1	33.72.803.1	33.89.426.1	500*400	79.68.514.1	36.48.850.1	33.72.925.1	33.89.536.1
300* 50	79.68.370.1				500*450	79.68.522.1	36.48.867.1	33.72.935.1	33.89.541.1
300* 80	79.68.394.1				600* 50	79.68.382.1			
300*100	79.68.416.1				600* 80	79.68.406.1			
300*150	79.68.436.1	33.70.816.1	33.72.816.1	33.89.431.1	600*100	79.68.428.1			
300*200	79.68.454.1	33.70.827.1	33.72.827.1	33.89.436.1	600*150	79.68.448.1			
300*250	79.68.470.1	33.70.839.1	33.72.839.1	33.89.441.1	600*200	79.68.466.1			
350* 50	79.68.372.1				600*250	79.68.482.1	36.50.890.1	36.63.890.1	33.89.546.1
350* 80	79.68.396.1				600*300	79.68.496.1	36.50.910.1	36.63.910.1	33.89.551.1
350*100	79.68.418.1				600*350	79.68.508.1	36.50.920.1	36.63.920.1	33.89.556.1
350*150	79.68.438.1	36.50.530.1	36.63.530.1	33.89.446.1	600*400	79.68.518.1	36.48.941.1	33.72.955.1	33.89.561.1
350*200	79.68.456.1	33.70.848.1	33.72.848.1	33.89.451.1	600*450	79.68.526.1	36.48.961.1	33.72.965.1	33.89.566.1
350*250	79.68.472.1	33.70.851.1	33.72.851.1	33.89.456.1	600*500	79.68.532.1	36.48.981.1	33.72.975.1	33.89.571.1
350*300	79.68.486.1	33.70.863.1	33.72.863.1	33.89.461.1					

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	001.1	451.1
	200-600	002.1	452.1
20	40- 80	003.1	453.1
	100-600	004.1	454.1
25	40- 40	025.1	465.1
	50- 50	026.1	466.1
	80-100	027.1	467.1
	150-600	028.1	468.1
40	50- 50	030.1	469.1
	80- 80	031.1	470.1
	100-100	032.1	471.1
	150-300	033.1	472.1
	350-600	034.1	473.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.70.052.1	450	76.81.70.552.1
840	76.81.70.054.1	840	76.81.70.554.1
1230	76.81.70.056.1	1230	76.81.70.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.442.1	230	76.83.37.101.1
813	76.80.61.444.1	255	76.83.37.102.1
1219	76.80.61.446.1	305	76.83.37.103.1
1524	76.80.61.448.1	355	76.83.37.105.1
1829	76.80.61.450.1	405	76.83.37.106.1
2134	76.80.61.452.1	455	76.83.37.107.1
2438	76.80.61.454.1		
2743	76.80.61.456.1		
3048	76.80.61.458.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.312.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.23.03.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.23.03.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.264.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GATE VALVE FLANGED	1	77.23.03.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.23.03.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.65.79.262.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.23.03.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GATE VALVE FLANGED	1	77.23.03.003.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
GATE VALVE FLANGED	2	77.23.03.003.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.312.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.33.03.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.33.03.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.264.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.33.03.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 13031

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	18.9	18.3	17.1	16.0	15.4	14.7	14.1	11.0
DN100-150	18.9	18.3	17.1	16.0	15.4	14.7	14.1	9.0
DN200-600	18.9	18.3	17.1	16.0	15.4	14.7	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- USE SPIRAL WOUND GASKETS (CLASS 11300), IF GRAPHITE TANGED
INSERT GASKETS ARE NOT ALLOWED DUE TO PRODUCT CONTAMINATION

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	40S
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	40S
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25	10S
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	10S
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	10S
300	C	C	C	C	E	E	E	E	E	E	E	A					80	10S
250	C	C	C	C	E	E	E	E	E	E	A						100	10S
200	C	C	C	C	D	D	E	E	E	A							150	10S
150	C	C	C	C	D	D	D	A									200	10S
100	C	C	C	C	D	D	A										250	10S
80	C	C	C	C	D	A											300	10S
50	C	C	C	B	A												350	10S
40	C	B	B	A													400	10S
25	B	B	A														450	10S
20	B	A															500	10S
15	A																600	10S

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 316	PLANT :	
CLASS NO. : 13031	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 13031, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
		DN350-600	ASTM A358-316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP316
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.36.33	018.1	026.1	033.1	049.1	057.1	065.1	073.1	082.1	091.1	103.1	115.1					
		74.36.34												127.1	137.1	147.1	157.1	177.1
PIPE NIPPLE	50MM	76.33.57	931.1	941.1	949.1	968.1												
* FLANGES																		
BLIND FLANGE		76.65.10	312.1	314.1	316.1	318.1	320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	342.1
SPECTACLE BLIND FLANGE		76.88.10	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	190.1	194.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	444.1
WELDING NECK FLANGE		76.65.79	262.1	264.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1
* FITTINGS																		
CAP BUTT-WELD.END		76.33.19	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	786.1	796.1	804.1	824.1	834.1	854.1	874.1	893.1	904.1	917.1	933.1	948.1	957.1	968.1	979.1	999.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.03.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE FLANGED		77.13.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.23.03								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.33.03	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	402.1	404.1	406.1	408.1												
ORIFICE FLANGE SET		76.65.92					470.1	472.1	264.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1
STRAINER Y-TYPE		76.83.21					402.1	404.1	406.1	409.1	411.1	412.1	415.1	416.1	419.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		33.70.566.1	33.72.566.1	33.85.618.1	400* 50	79.68.374.1			
25* 15		33.70.579.1	33.72.579.1	33.85.632.1	400* 80	79.68.398.1			
25* 20		33.70.589.1	33.72.589.1	33.85.637.1	400*100	79.68.420.1			
40* 15		33.70.599.1	33.72.599.1	33.85.643.1	400*150	79.68.440.1	36.50.620.1	36.63.620.1	33.89.466.1
40* 20		33.70.619.1	33.72.619.1	33.85.649.1	400*200	79.68.458.1	33.70.869.1	33.72.869.1	33.89.471.1
40* 25		33.70.624.1	33.72.624.1	33.85.656.1	400*250	79.68.474.1	33.70.873.1	33.72.873.1	33.89.476.1
50* 20		36.50.090.1	36.63.090.1	33.85.665.1	400*300	79.68.488.1	33.70.878.1	33.72.878.1	33.89.481.1
50* 25		33.70.634.1	33.72.634.1	33.85.673.1	400*350	79.68.500.1	33.70.892.1	33.72.892.1	33.89.486.1
50* 40		33.70.644.1	33.72.644.1	33.85.683.1	450* 50	79.68.376.1			
80* 40		33.70.674.1	33.72.674.1	33.85.693.1	450* 80	79.68.400.1			
80* 50	79.68.360.1	33.70.684.1	33.72.684.1	33.89.352.1	450*100	79.68.422.1			
100* 40		33.70.693.1	33.72.693.1	33.89.360.1	450*150	79.68.442.1			
100* 50	79.68.362.1	33.70.704.1	33.72.704.1	33.89.368.1	450*200	79.68.460.1	36.50.700.1	36.63.700.1	33.89.491.1
100* 80	79.68.386.1	33.70.714.1	33.72.714.1	33.89.376.1	450*250	79.68.476.1	36.48.714.1	33.72.897.1	33.89.496.1
150* 50	79.68.364.1				450*300	79.68.490.1	36.48.731.1	33.72.900.1	33.89.501.1
150* 80	79.68.388.1	33.70.744.1	33.72.744.1	33.89.384.1	450*350	79.68.502.1	36.48.748.1	33.72.903.1	33.89.506.1
150*100	79.68.410.1	33.70.754.1	33.72.754.1	33.89.392.1	450*400	79.68.512.1	36.48.765.1	33.72.914.1	33.89.511.1
200* 50	79.68.366.1				500* 50	79.68.378.1			
200* 80	79.68.390.1				500* 80	79.68.402.1			
200*100	79.68.412.1	33.70.764.1	33.72.764.1	33.89.400.1	500*100	79.68.424.1			
200*150	79.68.432.1	33.70.774.1	33.72.774.1	33.89.408.1	500*150	79.68.444.1			
250* 50	79.68.368.1				500*200	79.68.462.1	36.50.790.1	36.63.790.1	33.89.516.1
250* 80	79.68.392.1				500*250	79.68.478.1	36.50.810.1	36.63.810.1	33.89.521.1
250*100	79.68.414.1	36.50.250.1	36.63.250.1	33.89.416.1	500*300	79.68.492.1	36.48.816.1	33.72.920.1	33.89.526.1
250*150	79.68.434.1	33.70.789.1	33.72.789.1	33.89.421.1	500*350	79.68.504.1	36.48.833.1	33.72.923.1	33.89.531.1
250*200	79.68.452.1	33.70.803.1	33.72.803.1	33.89.426.1	500*400	79.68.514.1	36.48.850.1	33.72.925.1	33.89.536.1
300* 50	79.68.370.1				500*450	79.68.522.1	36.48.867.1	33.72.935.1	33.89.541.1
300* 80	79.68.394.1				600* 50	79.68.382.1			
300*100	79.68.416.1				600* 80	79.68.406.1			
300*150	79.68.436.1	33.70.816.1	33.72.816.1	33.89.431.1	600*100	79.68.428.1			
300*200	79.68.454.1	33.70.827.1	33.72.827.1	33.89.436.1	600*150	79.68.448.1			
300*250	79.68.470.1	33.70.839.1	33.72.839.1	33.89.441.1	600*200	79.68.466.1			
350* 50	79.68.372.1				600*250	79.68.482.1	36.50.890.1	36.63.890.1	33.89.546.1
350* 80	79.68.396.1				600*300	79.68.496.1	36.50.910.1	36.63.910.1	33.89.551.1
350*100	79.68.418.1				600*350	79.68.508.1	36.50.920.1	36.63.920.1	33.89.556.1
350*150	79.68.438.1	36.50.530.1	36.63.530.1	33.89.446.1	600*400	79.68.518.1	36.48.941.1	33.72.955.1	33.89.561.1
350*200	79.68.456.1	33.70.848.1	33.72.848.1	33.89.451.1	600*450	79.68.526.1	36.48.961.1	33.72.965.1	33.89.566.1
350*250	79.68.472.1	33.70.851.1	33.72.851.1	33.89.456.1	600*500	79.68.532.1	36.48.981.1	33.72.975.1	33.89.571.1
350*300	79.68.486.1	33.70.863.1	33.72.863.1	33.89.461.1					

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	001.1	451.1
	200-600	002.1	452.1
20	40- 80	003.1	453.1
	100-600	004.1	454.1
25	40- 40	025.1	465.1
	50- 50	026.1	466.1
	80-100	027.1	467.1
	150-600	028.1	468.1
40	50- 50	030.1	469.1
	80- 80	031.1	470.1
	100-100	032.1	471.1
	150-300	033.1	472.1
	350-600	034.1	473.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450	76.81.70.052.1
840	76.81.70.054.1
1230	76.81.70.056.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356	76.80.61.442.1
813	76.80.61.444.1
1219	76.80.61.446.1
1524	76.80.61.448.1
1829	76.80.61.450.1
2134	76.80.61.452.1
2438	76.80.61.454.1
2743	76.80.61.456.1
3048	76.80.61.458.1

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.03.003.1	
BLIND FLANGE	1	76.65.10.312.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.03.004.1	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.264.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.03.004.1	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.03.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.65.79.262.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.03.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.03.03.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.312.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.33.03.003.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.33.03.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.264.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.33.03.004.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 13091

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	-200	0	50	75	100	125	150
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	PRESSURE BAR GA						
DN15 -600	18.9	18.9	18.2	16.8	15.6	14.8	14.1

NOTES

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- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.1
 - FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR FLANGE, BOLTING AND GASKET SELECTION
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	40S
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	40S
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	10S
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	10S
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	10S
300	C	C	C	C	D	E	E	E	E	E	E	E	E	E	E		80	10S
250	C	C	C	C	D	D	D	D	D	A							100	10S
200	C	C	C	C	D	D	D	D	D	A							150	10S
150	C	C	C	C	D	D	D	D	A								200	10S
100	C	C	C	C	D	D	A										250	10S
80	C	C	C	C	D	A											300	10S
50	C	C	C	B	A												350	10S
40	C	B	B	A													400	10S
25	B	B	A														450	10S
20	B	A															500	10S
15	A																600	10S

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 304 LT	PLANT :	
CLASS NO. : 13091	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 13091, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP304
		DN350-600	ASTM A358-304
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP304

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F304
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F304
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F304
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240-TP304
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240-TP304
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F304

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A403-WP304
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP304
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP304
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A403-WP304

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F304
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F304
BR0B	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F304
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A403-WP304
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A403-WP304
		DN100-100	ASTM A403-WP304H
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP304

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F304
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B8 CL.2/A194-8
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

13091, REV.B PAGE 3

		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.36.03	018.1	026.1	033.1	041.1	057.1	065.1	073.1	082.1	091.1	103.1	115.1					
		74.36.05												127.1	137.1	147.1	157.1	178.1
PIPE NIPPLE 50MM		76.33.57	631.1	641.1	649.1	668.1												
* FLANGES																		
BLIND FLANGE		76.65.10	612.1	614.1	616.1	618.1	620.1	622.1	624.1	626.1	628.1	630.1	632.1	634.1	636.1	638.1	640.1	642.1
SPECTACLE BLIND FLANGE		76.88.09	708.1	712.1	716.1	718.1	720.1	722.1	724.1	726.1	728.1	730.1	732.1	734.1	736.1	738.1	740.1	744.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	094.1
WELDING NECK FLANGE		76.65.79			106.1	108.1	110.1	112.1	114.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1
		76.65.80	732.1	734.1														
* FITTINGS																		
CAP BUTT-WELD.END		76.33.18	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1	698.1	707.1	718.1	729.1	750.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.38	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1	698.1	707.1	718.1	729.1	750.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.40	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1	698.1	707.1	718.1	729.1	750.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1	698.1	707.1	718.1	729.1	750.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.03.08	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
CHECK VALVE FLANGED		77.13.08	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GATE VALVE FLANGED		77.23.08								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLANGED		77.33.08	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1
METER RUN		76.65.96	402.1	404.1	406.1	408.1												
ORIFICE FLANGE SET		76.65.90					078.1	080.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1

BROB				RECB				REEB				TERB				BROB				RECB				REEB				BNIF				BNIP																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
15	4	1/2	*	60	43.153.1	15	4	1/2	*	70	43.155.1
20	4	1/2	*	70	43.155.1	20	4	1/2	*	70	43.155.1
25	4	1/2	*	70	43.155.1	25	4	1/2	*	80	43.157.1
40	4	1/2	*	80	43.157.1	40	4	1/2	*	80	43.157.1
50	4	5/8	*	80	43.269.1						
80	4	5/8	*	100	43.273.1						
100	8	5/8	*	100	43.273.1						
150	8	3/4	*	100	43.329.1						
200	8	3/4	*	110	43.330.1						
250	12	7/8	*	120	43.401.1						
300	12	7/8	*	120	43.401.1						
350	12	1	*	130	43.468.1						
400	16	1	*	140	43.469.1						
450	16	1 1/8	*	150	43.529.1						
500	20	1 1/8	*	160	43.530.1						
600	20	1 1/4	*	180	43.590.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	70 43.155.1
					20	4	1/2	*	70 43.155.1
					25	4	1/2	*	80 43.157.1
					40	4	1/2	*	80 43.157.1
50	8	5/8	*	150 43.281.1	50	4	5/8	*	90 43.271.1
80	8	3/4	*	150 43.337.1	80	4	5/8	*	110 43.274.1
100	12	3/4	*	140 43.335.1	100	8	5/8	*	110 43.274.1
150	12	3/4	*	140 43.335.1	150	8	3/4	*	120 43.332.1
200	12	7/8	*	150 43.406.1	200	8	3/4	*	130 43.334.1
250	16	1	*	170 43.474.1	250	12	7/8	*	140 43.404.1
300	16	1 1/8	*	190 43.535.1	300	12	7/8	*	150 43.406.1
350	20	1 1/8	*	200 43.527.1	350	12	1	*	160 43.472.1
400	20	1 1/4	*	210 43.595.1	400	16	1	*	170 43.474.1
450	24	1 1/4	*	220 43.597.1	450	16	1 1/8	*	180 43.533.1
500	24	1 1/4	*	230 43.598.1	500	20	1 1/8	*	200 43.527.1
600	24	1 1/2	*	260 43.690.1	600	20	1 1/4	*	220 43.597.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.003.1	
BLIND FLANGE	1	76.65.10.612.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	8	81.38.43.153.1	
WELDING NECK FLANGE	1	76.65.80.732.1	

* DRAIN POINT	DN 20	FIG.2J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.004.1	
BLIND FLANGE	1	76.65.10.614.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
PIPE NIPPLE 50MM	1	76.33.57.641.1	
STUD BOLT WITH NUTS	8	81.38.43.155.1	
WELDING NECK FLANGE	1	76.65.80.734.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.004.1	
BLIND FLANGE	1	76.65.10.614.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
STUD BOLT WITH NUTS	8	81.38.43.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.03.08.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.65.20.208.1	
STUD BOLT WITH NUTS	8	81.38.43.153.1	
	8	81.38.43.155.1	
WELDING NECK FLANGE	2	76.65.80.732.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.65.20.208.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	4	81.38.43.153.1	
	4	81.38.43.155.1	
WELDING NECK FLANGE	1	76.65.80.732.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.003.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
LAP-JOINT FLANGE	1	76.65.20.208.1	
STUD BOLT WITH NUTS	4	81.38.43.153.1	
	4	81.38.43.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.03.08.003.1	
GASKET, RF TANGED INSERT	4	85.30.01.004.1	
LAP-JOINT FLANGE	2	76.65.20.208.1	
STUD BOLT WITH NUTS	8	81.38.43.153.1	
	8	81.38.43.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.631.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.43.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.631.1	
GASKET, RF TANGED INSERT	1	85.30.01.012.1	
STUD BOLT WITH NUTS	4	81.38.43.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.612.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
GLOBE VALVE FLANGED	1	77.33.08.003.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	8	81.38.43.153.1	
WELDING NECK FLANGE	1	76.65.80.732.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.614.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.33.08.004.1	
PIPE NIPPLE 50MM	1	76.33.57.641.1	
STUD BOLT WITH NUTS	8	81.38.43.155.1	
WELDING NECK FLANGE	1	76.65.80.734.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.614.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
GLOBE VALVE FLANGED	1	77.33.08.004.1	
STUD BOLT WITH NUTS	8	81.38.43.155.1	

CLASS 13100

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	18.9	18.3	17.1	16.0	15.4	14.7	14.1	11.0
DN100-150	18.9	18.3	17.1	16.0	15.4	14.7	14.1	9.0
DN200-600	18.9	18.3	17.1	16.0	15.4	14.7	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR CONNECTIONS CLASS 300, USE EQUIVALENT CLASS 300 FOR
FLANGE, BOLTING AND GASKET SELECTION
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	40S
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	40S
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	10S
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	10S
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	10S
300	C	C	C	C	E	E	E	E	E	E	E	A					80	10S
250	C	C	C	C	E	E	E	E	E	E	A						100	10S
200	C	C	C	C	D	D	E	E	E	A							150	10S
150	C	C	C	C	D	D	D	A									200	10S
100	C	C	C	C	D	D	D	A									250	10S
80	C	C	C	C	D	A											300	10S
50	C	C	C	B	A												350	10S
40	C	B	B	A													400	10S
25	B	B	A														450	10S
20	B	A															500	10S
15	A																600	10S

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
 B REDUCING TEE
 C BRANCH FITTING
 D PIPE TO PIPE
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 316	PLANT :	
CLASS NO. : 13100	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 13100, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
		DN350-600	ASTM A358-316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A403-WP316L

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE,FKM
GAVF	GATE VALVE FLANGED	DN300-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLBF	GLOBE VALVE FLG. BELLOWS SEAL.	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.36.33	018.1	026.1	033.1	049.1	057.1	065.1	073.1	082.1	091.1	103.1	115.1					
		74.36.34												127.1	137.1	147.1	157.1	177.1
PIPE NIPPLE 50MM		76.33.57	931.1	941.1	949.1	968.1												
* FLANGES																		
BLIND FLANGE		76.65.10	312.1	314.1	316.1	318.1	320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	342.1
SPECTACLE BLIND FLANGE		76.88.10	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	190.1	194.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	444.1
WELDING NECK FLANGE		76.65.79	262.1	264.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1
* FITTINGS																		
CAP BUTT-WELD.END		76.33.19	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1	447.1	457.1	467.1	477.1	487.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	786.1	796.1	804.1	824.1	834.1	854.1	874.1	893.1	904.1	917.1	933.1	948.1	957.1	968.1	979.1	999.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.03.00	703.1	704.1	705.1	707.1	708.1	710.1	712.1	764.1	765.1	766.1						
CHECK VALVE FLANGED		77.13.17	003.1	004.1	005.1	007.1												
DUAL PL. CHECK VALVE WAFER LUG		77.68.53					508.1	510.1	512.1	514.1	515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
GATE VALVE FLANGED		77.23.18											017.1	018.1	019.1	020.1	021.1	023.1
GLOBE VALVE FLG. BELLOWS SEAL.		77.33.18	403.1	404.1	405.1	407.1	408.1	410.1	412.1	414.1	415.1							
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	304.1	306.1	308.1	312.1	314.1	318.1	320.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	342.1
METER RUN		76.65.96	402.1	404.1	406.1	408.1												
ORIFICE FLANGE SET		76.65.92					470.1	472.1	264.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		33.70.566.1	33.72.566.1	33.85.618.1	400* 50	79.68.374.1			
25* 15		33.70.579.1	33.72.579.1	33.85.632.1	400* 80	79.68.398.1			
25* 20		33.70.589.1	33.72.589.1	33.85.637.1	400*100	79.68.420.1			
40* 15		33.70.599.1	33.72.599.1	33.85.643.1	400*150	79.68.440.1	36.50.620.1	36.63.620.1	33.89.466.1
40* 20		33.70.619.1	33.72.619.1	33.85.649.1	400*200	79.68.458.1	33.70.869.1	33.72.869.1	33.89.471.1
40* 25		33.70.624.1	33.72.624.1	33.85.656.1	400*250	79.68.474.1	33.70.873.1	33.72.873.1	33.89.476.1
50* 20		36.50.090.1	36.63.090.1	33.85.665.1	400*300	79.68.488.1	33.70.878.1	33.72.878.1	33.89.481.1
50* 25		33.70.634.1	33.72.634.1	33.85.673.1	400*350	79.68.500.1	33.70.892.1	33.72.892.1	33.89.486.1
50* 40		33.70.644.1	33.72.644.1	33.85.683.1	450* 50	79.68.376.1			
80* 40		33.70.674.1	33.72.674.1	33.85.693.1	450* 80	79.68.400.1			
80* 50	79.68.360.1	33.70.684.1	33.72.684.1	33.89.352.1	450*100	79.68.422.1			
100* 40		33.70.693.1	33.72.693.1	33.89.360.1	450*150	79.68.442.1			
100* 50	79.68.362.1	33.70.704.1	33.72.704.1	33.89.368.1	450*200	79.68.460.1	36.50.700.1	36.63.700.1	33.89.491.1
100* 80	79.68.386.1	33.70.714.1	33.72.714.1	33.89.376.1	450*250	79.68.476.1	36.48.714.1	33.72.897.1	33.89.496.1
150* 50	79.68.364.1				450*300	79.68.490.1	36.48.731.1	33.72.900.1	33.89.501.1
150* 80	79.68.388.1	33.70.744.1	33.72.744.1	33.89.384.1	450*350	79.68.502.1	36.48.748.1	33.72.903.1	33.89.506.1
150*100	79.68.410.1	33.70.754.1	33.72.754.1	33.89.392.1	450*400	79.68.512.1	36.48.765.1	33.72.914.1	33.89.511.1
200* 50	79.68.366.1				500* 50	79.68.378.1			
200* 80	79.68.390.1				500* 80	79.68.402.1			
200*100	79.68.412.1	33.70.764.1	33.72.764.1	33.89.400.1	500*100	79.68.424.1			
200*150	79.68.432.1	33.70.774.1	33.72.774.1	33.89.408.1	500*150	79.68.444.1			
250* 50	79.68.368.1				500*200	79.68.462.1	36.50.790.1	36.63.790.1	33.89.516.1
250* 80	79.68.392.1				500*250	79.68.478.1	36.50.810.1	36.63.810.1	33.89.521.1
250*100	79.68.414.1	36.50.250.1	36.63.250.1	33.89.416.1	500*300	79.68.492.1	36.48.816.1	33.72.920.1	33.89.526.1
250*150	79.68.434.1	33.70.789.1	33.72.789.1	33.89.421.1	500*350	79.68.504.1	36.48.833.1	33.72.923.1	33.89.531.1
250*200	79.68.452.1	33.70.803.1	33.72.803.1	33.89.426.1	500*400	79.68.514.1	36.48.850.1	33.72.925.1	33.89.536.1
300* 50	79.68.370.1				500*450	79.68.522.1	36.48.867.1	33.72.935.1	33.89.541.1
300* 80	79.68.394.1				600* 50	79.68.382.1			
300*100	79.68.416.1				600* 80	79.68.406.1			
300*150	79.68.436.1	33.70.816.1	33.72.816.1	33.89.431.1	600*100	79.68.428.1			
300*200	79.68.454.1	33.70.827.1	33.72.827.1	33.89.436.1	600*150	79.68.448.1			
300*250	79.68.470.1	33.70.839.1	33.72.839.1	33.89.441.1	600*200	79.68.466.1			
350* 50	79.68.372.1				600*250	79.68.482.1	36.50.890.1	36.63.890.1	33.89.546.1
350* 80	79.68.396.1				600*300	79.68.496.1	36.50.910.1	36.63.910.1	33.89.551.1
350*100	79.68.418.1				600*350	79.68.508.1	36.50.920.1	36.63.920.1	33.89.556.1
350*150	79.68.438.1	36.50.530.1	36.63.530.1	33.89.446.1	600*400	79.68.518.1	36.48.941.1	33.72.955.1	33.89.561.1
350*200	79.68.456.1	33.70.848.1	33.72.848.1	33.89.451.1	600*450	79.68.526.1	36.48.961.1	33.72.965.1	33.89.566.1
350*250	79.68.472.1	33.70.851.1	33.72.851.1	33.89.456.1	600*500	79.68.532.1	36.48.981.1	33.72.975.1	33.89.571.1
350*300	79.68.486.1	33.70.863.1	33.72.863.1	33.89.461.1					

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE		
15	40-150	001.1	451.1
	200-600	002.1	452.1
20	40- 80	003.1	453.1
	100-600	004.1	454.1
25	40- 40	025.1	465.1
	50- 50	026.1	466.1
	80-100	027.1	467.1
	150-600	028.1	468.1
40	50- 50	030.1	469.1
	80- 80	031.1	470.1
	100-100	032.1	471.1
	150-300	033.1	472.1
	350-600	034.1	473.1

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80					
80	4	5/8	*	100					
100	8	5/8	*	100					
150	8	3/4	*	100					
200	8	3/4	*	110					
250	12	7/8	*	120					
300	12	7/8	*	120					
350	12	1	*	130					
400	16	1	*	140					
450	16	1 1/8	*	150					
500	20	1 1/8	*	160					
600	20	1 1/4	*	180					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	70
					20	4	1/2	*	70
					25	4	1/2	*	80
					40	4	1/2	*	80
50	8	5/8	*	150	50	4	5/8	*	90
80	8	3/4	*	150	80	4	5/8	*	110
100	12	3/4	*	140	100	8	5/8	*	110
150	12	3/4	*	140	150	8	3/4	*	120
200	12	7/8	*	150	200	8	3/4	*	130
250	16	1	*	170	250	12	7/8	*	140
300	16	1 1/8	*	190	300	12	7/8	*	150
350	20	1 1/8	*	200	350	12	1	*	160
400	20	1 1/4	*	210	400	16	1	*	170
450	24	1 1/4	*	220	450	16	1 1/8	*	180
500	24	1 1/4	*	230	500	20	1 1/8	*	200
600	24	1 1/2	*	260	600	20	1 1/4	*	220

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.00.703.1	
BLIND FLANGE	1	76.65.10.312.1	
GASKET, SPIRAL WOUND	2	85.41.46.304.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.00.704.1	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, SPIRAL WOUND	2	85.41.46.306.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.264.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.00.704.1	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, SPIRAL WOUND	2	85.41.46.306.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.03.00.703.1	
GASKET, SPIRAL WOUND	4	85.41.46.304.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.65.79.262.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.00.703.1	
GASKET, SPIRAL WOUND	2	85.41.46.304.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.00.703.1	
GASKET, SPIRAL WOUND	2	85.41.46.304.1	
LAP-JOINT FLANGE	1	76.62.20.208.1	
STUD BOLT WITH NUTS	4	81.38.61.153.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.03.00.703.1	
GASKET, SPIRAL WOUND	4	85.41.46.304.1	
LAP-JOINT FLANGE	2	76.62.20.208.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, SPIRAL WOUND	1	85.41.46.312.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1	
GASKET, SPIRAL WOUND	1	85.41.46.312.1	
STUD BOLT WITH NUTS	4	81.38.61.159.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.312.1	
GASKET, SPIRAL WOUND	2	85.41.46.304.1	
GLOBE VALVE FLG. BELLOWS SEAL.	1	77.33.18.403.1	
STUD BOLT WITH NUTS	8	81.38.61.153.1	
WELDING NECK FLANGE	1	76.65.79.262.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, SPIRAL WOUND	2	85.41.46.306.1	
GLOBE VALVE FLG. BELLOWS SEAL.	1	77.33.18.404.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.65.79.264.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.314.1	
GASKET, SPIRAL WOUND	2	85.41.46.306.1	
GLOBE VALVE FLG. BELLOWS SEAL.	1	77.33.18.404.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

CLASS 15011

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS			
0 50			

PRESSURE BAR GA			
DN15 -50	8.0	8.0	

NOTES

- -----
- MALONEY TYPE GASKETS TO BE USED FOR CONNECTIONS BETWEEN ALUMINIUM-BRASS AND STEEL FLANGES.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

TABLE OF SCHEDULES

DN	SCHEDULE
----	-----
15	2.7
20	2.9
25	3.2
40	3.8
50	3.9
80	.
100	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALUMINIUM BRASS	PLANT	:	
CLASS NO. : 15011	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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* PIPE

PIPE	PIPE	DN 15-	50	ASTM B111	UNS C68700
PNTT	PIPE NIPPLE THRD. ENDS L= 50MM	DN 15-	25	ASTM B111	UNS C68700
PT75	PIPE NIPPLE THRD. ENDS L= 75MM	DN 15-	50	ASTM B111	UNS C68700
PT99	PIPE NIPPLE THRD. ENDS L=100MM	DN 15-	50	ASTM B111	UNS C68700

* FLANGES

BLFL	BLIND FLANGE	DN 15-	50	ASTM B62	UNS C83600
FLTR	FLANGE THREADED	DN 15-	50	ASTM B62	UNS C83600
REFT	REDUCING FLANGE THREADED END	DN 20-	100	ASTM B62	UNS C83600

* FITTINGS

CAPT	CAP THREADED	DN 15-	50	ASTM B62	UNS C83600
COUT	COUPLING THREADED ENDS	DN 15-	50	ASTM B62	UNS C83600
E45T	ELBOW 45DEG. THREADED ENDS	DN 15-	50	ASTM B62	UNS C83600
E90T	ELBOW 90DEG. THREADED ENDS	DN 15-	50	ASTM B62	UNS C83600
PLUG	PLUG NPT	DN 15-	50	ASTM B62	UNS C83600
TEET	TEE THREADED ENDS	DN 15-	50	ASTM B62	UNS C83600

* REDUCING FITTINGS

REBU	REDUCED BUSHING THRD. ENDS	DN 20-	50	ASTM B62	UNS C83600
RECT	REDUCER CONC. THRD. ENDS	DN 20-	50	ASTM B62	UNS C83600

* VALVES

CHVT	CHECK VALVE THREADED ENDS	DN 15-	50	BODY/TRIM: ASTM B148
GAVT	GATE VALVE THREADED ENDS	DN 15-	50	BODY: ASTM B148
				TRIM: ASTM B148
GLVT	GLOBE VALVE THREADED ENDS	DN 15-	50	BODY: ASTM B148
				TRIM: ASTM B148

* MISCELLANEOUS

GKFF	GASKET, FLAT FACE	DN 15-	100	PTFE REINF.WITH MINERAL FILLER
ISBS	GASKET, ISOLATION SET	DN 15-	100	GASKET: PHENOLIC NEOPR. LINED
				SLEEVE: PHENOLIC
				WASHER: PHENOLIC AND STEEL
STBT	STUD BOLT WITH NUTS	---		ASTM A193-B7/A194-2H

PIPING COMPONENTS

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		NOMINAL PIPE SIZE							
		15	20	25	40	50	80	100	
ITEM	DESCRIPTION	MESC							

* PIPE									
PIPE		74.66.14	508.1	512.1	516.1	520.1	524.1		
PIPE NIPPLE THRD. ENDS L= 50MM		76.01.56	482.1	522.1	562.1				
PIPE NIPPLE THRD. ENDS L= 75MM		76.01.56	483.1	523.1	563.1	583.1	603.1		
PIPE NIPPLE THRD. ENDS L=100MM		76.01.56	484.1	524.1	564.1	584.1	604.1		
* FLANGES									
BLIND FLANGE		76.60.11	008.1	012.1	016.1	020.1	024.1		
FLANGE THREADED		76.60.50	012.1	014.1	016.1	018.1	020.1		
* FITTINGS									
CAP THREADED		76.01.18	008.1	012.1	016.1	018.1	020.1		
COUPLING THREADED ENDS		76.01.28	008.1	012.1	016.1	018.1	020.1		
ELBOW 45DEG. THREADED ENDS		76.01.38	008.1	012.1	016.1	018.1	020.1		
ELBOW 90DEG. THREADED ENDS		76.01.39	008.1	012.1	016.1	018.1	020.1		
PLUG NPT		76.01.66	108.1	112.1	116.1	118.1	120.1		
TEE THREADED ENDS		76.01.84	008.1	012.1	016.1	018.1	020.1		
* VALVES									
CHECK VALVE THREADED ENDS		77.17.01	003.1	004.1	005.1	007.1	008.1		
GATE VALVE THREADED ENDS		77.27.01	003.1	004.1	005.1	007.1	008.1		
GLOBE VALVE THREADED ENDS		77.37.01	003.1	004.1	005.1	007.1	008.1		
* MISCELLANEOUS									
GASKET, FLAT FACE		85.48.74	204.1	206.1	208.1	212.1	214.1	218.1	
GASKET, ISOLATION SET		85.48.55	004.1	006.1	008.1	012.1	014.1	018.1	
								220.1	

REDUCING/PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		REBU	RECT	REFT
		76.	76.	76.
RUN* BR		-----		
20*	15	01.14.122.1	01.70.122.1	60.60.030.1
25*	15	01.14.162.1	01.70.162.1	60.60.040.1
25*	20	01.14.164.1	01.70.164.1	60.60.042.1
40*	15	01.14.181.1	01.70.181.1	60.60.060.1
40*	20	01.14.183.1	01.70.183.1	60.60.061.1
40*	25	01.14.185.1	01.70.185.1	60.60.063.1
50*	15	01.14.200.1	01.70.200.1	60.60.080.1
50*	20	01.14.201.1	01.70.201.1	60.60.082.1
50*	25	01.14.202.1	01.70.202.1	60.60.084.1
50*	40	01.14.204.1	01.70.204.1	60.60.086.1
80*	15			60.60.090.1
80*	20			60.60.092.1
80*	25			60.60.094.1
80*	40			60.60.096.1
80*	50			60.60.098.1
100*	15			60.60.110.1
100*	20			60.60.112.1
100*	25			60.60.114.1
100*	40			60.60.116.1
100*	50			60.60.118.1

COMP.	
NAME	DESCRIPTION
-----	-----
REBU	REDUCED BUSHING THRD. ENDS
RECT	REDUCER CONC. THRD. ENDS
REFT	REDUCING FLANGE THREADED END

BOLTING
BOLTSET FLANGED JOINTS

81.38					
DN	NR	INCH	*	MM	
15	4	1/2	*	60	61.153.1
20	4	1/2	*	70	61.155.1
25	4	1/2	*	70	61.155.1
40	4	1/2	*	80	61.157.1
50	4	5/8	*	80	61.269.1
80	4	5/8	*	100	61.273.1
100	8	5/8	*	100	61.273.1

CLASS 16021

DESIGN LIMITS						
TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	125	150

PRESSURE BAR GA						
DN15 -200	12.0	11.5	11.0	10.5	10.0	10.0

- NOTES
-
- DESIGN LIMITS ACC.TO 80% OF ASME B16.5 FL.RATING MAT.GRP 3.4
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - BLIND FLANGES TO BE PROVIDED WITH LINER.

BRANCH CONNECTIONS 90 DEGREES									
BRANCHSIZE									
RUN SIZE	20		40		80		150		
	15	25	50	100	200				

200	C	C	C	C	D	D	D	D	A
150	C	C	C	C	D	D	D	A	
100	C	C	C	C	D	D	A		
80	C	C	C	C	D	A			
50	C	C	C	B	A				
40	C	B	B	A					
25	B	B	A						
20	B	A							
15	A								

TABLE OF SCHEDULES	
DN	SCHEDULE

15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	10S
200	10S

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

NI-CU ALLOY (MONEL 400)	PLANT	:	
CLASS NO. : 16021	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-200	ASTM B165	UNS N04400
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM B165	UNS N04400

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
FLIN	BLIND FLANGE LINER	DN 15-200	ASTM B127 UNS N04400
LJFL	LAP-JOINT FLANGE	DN 15-200	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-200	ASTM B366-WPNC-S
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM B366-WPNC-S/W
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM B366-WPNC-S/W
STBE	STUB-END	DN 15-200	ASTM B366-WPNC-S/W
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM B366-WPNC-S/W

* REDUCING FITTINGS

BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM B564 UNS N04400
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM B366-WPNC-S/W
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM B366-WPNC-S/W
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-100	ASTM B366-WPNC-S/W

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-200	BODY: MONEL 400 UNS N04400 TRIM: MONEL 400/PTFE
CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: MONEL 400 UNS N04400 TRIM: MONEL 400
GAVF	GATE VALVE FLANGED	DN 15-200	BODY: MONEL 400 UNS N04400 TRIM: MONEL 400
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: MONEL 400 UNS N04400 TRIM: MONEL 400

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-200	GRAPHITE
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE									
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200

* PIPE											
PIPE		74.78.50	219.1	227.1	233.1	249.1	257.1	265.1	273.1	282.1	292.1
PIPE NIPPLE 50MM		76.28.57	431.1	441.1	461.1	481.1					
* FLANGES											
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1
BLIND FLANGE LINER		76.80.81	501.1	502.1	503.1	505.1	506.1	507.1	508.1	510.1	511.1
LAP-JOINT FLANGE		76.62.20	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1
* FITTINGS											
CAP BUTT-WELD.END		76.28.16	036.1	046.1	054.1	074.1	084.1	104.1	124.1	144.1	154.1
ELBOW 45 DEG BUTT-WELD ENDS		76.28.36	036.1	046.1	054.1	074.1	084.1	104.1	124.1	144.1	154.1
ELBOW 90 DEG BUTT-WELD ENDS		76.28.41	036.1	046.1	054.1	074.1	084.1	104.1	124.1	144.1	154.1
STUB-END		76.28.56	036.1	046.1	054.1	074.1	084.1	104.1	124.1	144.1	154.1
EQUAL TEE BUTT-WELD ENDS		76.28.86	036.1	046.1	054.1	074.1	084.1	104.1	124.1	144.1	154.1
* VALVES											
BALL VALVE RED. BORE FLANGED		77.06.20	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1
CHECK VALVE FLANGED		77.16.20	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1
GATE VALVE FLANGED		77.26.20	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1
GLOBE VALVE FLANGED		77.36.20	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1
* MISCELLANEOUS											
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1

		RECB	REEB	TERB
		76.	76.	76.
RUN*	BR	-----		
20*	15	28.65.066.1	28.73.066.1	28.91.518.1
25*	15	28.65.079.1	28.73.079.1	28.91.532.1
25*	20	28.65.089.1	28.73.089.1	28.91.537.1
40*	15	28.65.099.1	28.73.099.1	
40*	20	28.65.119.1	28.73.119.1	28.91.547.1
40*	25	28.65.124.1	28.73.124.1	28.91.572.1
50*	20	28.65.131.1	28.73.131.1	
50*	25	28.65.134.1	28.73.134.1	28.91.582.1
50*	40	28.65.144.1	28.73.144.1	28.91.583.1
80*	40	28.65.174.1	28.73.174.1	
80*	50	28.65.184.1	28.73.184.1	28.91.602.1
100*	40	28.65.194.1	28.73.194.1	
100*	50	28.65.204.1	28.73.204.1	28.91.618.1
100*	80	28.65.214.1	28.73.214.1	28.91.626.1
150*	80	28.65.244.1	28.73.244.1	
150*	100	28.65.254.1	28.73.254.1	
200*	100	28.65.264.1	28.73.264.1	
200*	150	28.65.274.1	28.73.274.1	

		BNIP	
		76.80.30	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	102.1	
	200-200	104.1	
20	40- 80	106.1	
	100-200	108.1	
25	40- 40		753.1
	50- 50		754.1
	80-100		755.1
	150-200		756.1
40	50- 50		757.1
	80- 80		758.1
	100-100		759.1
	150-200		760.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIP	BRANCH FITTING PLAIN-END OUTL.
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.121.1
255	76.83.37.122.1
305	76.83.37.123.1
355	76.83.37.125.1
405	76.83.37.126.1
455	76.83.37.127.1

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET FOR LAP FLANGES

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	60	15	4	1/2	*	70
20	4	1/2	*	70	20	4	1/2	*	70
25	4	1/2	*	70	25	4	1/2	*	80
40	4	1/2	*	80	40	4	1/2	*	80
50	4	5/8	*	80	50	4	5/8	*	90
80	4	5/8	*	100	80	4	5/8	*	100
100	8	5/8	*	100	100	8	5/8	*	100
150	8	3/4	*	100	150	8	3/4	*	110
200	8	3/4	*	110	200	8	3/4	*	120

BOLTSET SPECTACLE/SPACER

81.38				
DN	NR	INCH	*	MM
15	4	1/2	*	70
20	4	1/2	*	70
25	4	1/2	*	80
40	4	1/2	*	80
50	4	5/8	*	90
80	4	5/8	*	110
100	8	5/8	*	110
150	8	3/4	*	120
200	8	3/4	*	130

ASSEMBLIES

* DRAIN POINT DN 15 FIG.2V DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	1	77.06.20.003.1		
BLIND FLANGE	1	76.62.11.058.1		
BLIND FLANGE LINER	1	76.80.81.501.1		
GASKET, RF TANGED INSERT	2	85.30.01.004.1		
LAP-JOINT FLANGE	1	76.62.20.208.1		
STUB-END	1	76.28.56.036.1		
STUD BOLT WITH NUTS	4	81.38.61.153.1		
	4	81.38.61.155.1		

* DRAIN POINT DN 20 FIG.2V DN 40 -200				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	1	77.06.20.004.1		
BLIND FLANGE	1	76.62.11.062.1		
BLIND FLANGE LINER	1	76.80.81.502.1		
GASKET, RF TANGED INSERT	2	85.30.01.006.1		
LAP-JOINT FLANGE	1	76.62.20.212.1		
STUB-END	1	76.28.56.046.1		
STUD BOLT WITH NUTS	4	81.38.61.155.1		
	4	81.38.61.155.1		

* PRESSURE INSTR.CONN. DN 15 FIG.2V DN 15 -200				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	1	77.06.20.003.1		
GASKET, RF TANGED INSERT	2	85.30.01.004.1		
LAP-JOINT FLANGE	2	76.62.20.208.1		
STUB-END	1	76.28.56.036.1		
STUD BOLT WITH NUTS	8	81.38.61.155.1		

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* TEMPERATURE INSTR.C. DN 40 FIG.AS DN 80 - 80				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1		
LAP-JOINT FLANGE	1	76.62.20.218.1		
PIPE	0	74.78.50.249.1		
STUB-END	1	76.28.56.074.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.121.1		

* TEMPERATURE INSTR.C. DN 40 FIG.BS DN100 -200				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.531.1		
LAP-JOINT FLANGE	1	76.62.20.218.1		
PIPE	0	74.78.50.249.1		
STUB-END	1	76.28.56.074.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.122.1		

* VENT POINT DN 15 FIG.1V DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.058.1		
BLIND FLANGE LINER	1	76.80.81.501.1		
GASKET, RF TANGED INSERT	2	85.30.01.004.1		
GLOBE VALVE FLANGED	1	77.36.20.003.1		
LAP-JOINT FLANGE	1	76.62.20.208.1		
STUB-END	1	76.28.56.036.1		
STUD BOLT WITH NUTS	4	81.38.61.153.1		
	4	81.38.61.155.1		

* VENT POINT DN 20 FIG.1V DN 40 -200				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.062.1		
BLIND FLANGE LINER	1	76.80.81.502.1		
GASKET, RF TANGED INSERT	2	85.30.01.006.1		
GLOBE VALVE FLANGED	1	77.36.20.004.1		
LAP-JOINT FLANGE	1	76.62.20.212.1		
STUB-END	1	76.28.56.046.1		
STUD BOLT WITH NUTS	4	81.38.61.155.1		
	4	81.38.61.155.1		

CLASS 16071

DESIGN LIMITS								
TEMPERATURE IN DEGREES CELSIUS								
	0	50	75	100	125	150	175	200

	PRESSURE BAR GA							
DN15 -80	18.9	18.3	17.1	16.0	15.4	14.7	14.1	11.0
DN100-150	18.9	18.3	17.1	16.0	15.4	14.7	14.1	9.0
DN200-200	18.9	18.3	17.1	16.0	15.4	14.7	12.0	7.0

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2, AND LIMITED BY BS5351 BALL VALVE RATING
 - BENDING OF PIPE IS ALLOWED, BUT HEAT TREATMENT (SOLUTION ANNEAL) IS REQUIRED WHEN COLD DEFORMATION IS > 15%.
 - BLIND FLANGES TO BE PROVIDED WITH LINER.

BRANCH CONNECTIONS 90 DEGREES									
BRANCHSIZE									
RUN SIZE	20		40		80		150		
	15	25	50	100	200				

200	C	C	C	C	D	D	D	D	A
150	C	C	C	C	D	D	D	A	
100	C	C	C	C	D	D	A		
80	C	C	C	C	D	A			
50	C	C	C	B	A				
40	C	B	B	A					
25	B	B	A						
20	B	A							
15	A								

TABLE OF SCHEDULES

DN	SCHEDULE

15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	10S
200	10S

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

NI ALLOY	(HASTELLOY B2)	PLANT	:	
CLASS NO.	: 16071	CONSIGNEE	:	
ANS RATING	: CLASS 150	ENGINEERED BY	:	
CORR. ALL.	: 0 mm.	PRINCIPAL	:	
REV. LETTER	: B	CONTR.JOB NO.	:	
REV. DATE	: 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-	80	ASTM B622	UNS N10665
PNPP	PIPE NIPPLE 50MM	DN 15-	40	ASTM B622	UNS N10665

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
FLIN	BLIND FLANGE LINER	DN 15-200	ASTM B333 UNS N10665
LJFL	LAP-JOINT FLANGE	DN 15-200	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-200	ASTM B366-WPHB2-S
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM B366-WPHB2-S/W
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM B366-WPHB2-S/W
STBE	STUB-END	DN 15-200	ASTM B366-WPHB2-S/W
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM B366-WPHB2-S/W

* REDUCING FITTINGS

RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM B366-WPHB2-S/W
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM B366-WPHB2-S/W
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM B366-WPHB2-S/W

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-200	BODY: ASTM A494-N-12MV-CL 2 TRIM: ASTM B335, PTFE
CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: ASTM A494-N-12MV-CL 2 TRIM: ASTM B335
GAVF	GATE VALVE FLANGED	DN 15-200	BODY: ASTM A494-N-12MV-CL 2 TRIM: BODY MAT,ASTM B335
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A494-N-12MV-CL 2 TRIM: BODY MAT,ASTM B335

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 15-200	PTFE REINF.WITH MINERAL FILLER
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	STEM : ASTM B335 UNS N10665 FLANGE: ASTM B333 UNS N10665

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE									
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200

* PIPE											
PIPE		74.78.35	118.1	126.1	133.1	149.1	157.1	165.1	273.1	282.1	291.1
PIPE NIPPLE 50MM		76.28.57	781.1	791.1	801.1	816.1					
* FLANGES											
BLIND FLANGE		76.62.11	058.1	062.1	066.1	068.1	070.1	072.1	074.1	076.1	078.1
BLIND FLANGE LINER		76.80.81	961.1	962.1	963.1	965.1	966.1	967.1	968.1	970.1	971.1
LAP-JOINT FLANGE		76.65.20	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1
* FITTINGS											
CAP BUTT-WELD.END		76.28.17	436.1	446.1	454.1	474.1	484.1	504.1	524.1	544.1	554.1
ELBOW 45 DEG BUTT-WELD ENDS		76.28.37	436.1	446.1	454.1	474.1	484.1	504.1	524.1	544.1	554.1
ELBOW 90 DEG BUTT-WELD ENDS		76.28.42	236.1	246.1	254.1	274.1	248.1	304.1	324.1	344.1	354.1
STUB-END		76.28.54	436.1	446.1	454.1	474.1	484.1	504.1	524.1	544.1	554.1
EQUAL TEE BUTT-WELD ENDS		76.28.87	236.1	246.1	254.1	274.1	284.1	304.1	324.1	344.1	354.1
* VALVES											
BALL VALVE RED. BORE FLANGED		77.06.10	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1
CHECK VALVE FLANGED		77.16.10	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1
GATE VALVE FLANGED		77.26.10	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1
GLOBE VALVE FLANGED		77.36.10	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1
* MISCELLANEOUS											
GASKET, RAISED FACE		85.48.74	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1

		RECB	REEB	TERB
		76.	76.	76.
RUN*	BR			
20*	15	28.67.266.1	28.75.266.1	28.91.018.1
25*	15	28.67.279.1	28.75.279.1	28.91.032.1
25*	20	28.67.289.1	28.75.289.1	28.91.037.1
40*	15	28.67.299.1	28.75.299.1	
40*	20	28.67.319.1	28.75.319.1	28.91.047.1
40*	25	28.67.324.1	28.75.324.1	28.91.071.1
50*	20	28.67.331.1	28.75.331.1	
50*	25	28.67.334.1	28.75.334.1	28.91.072.1
50*	40	28.67.344.1	28.75.344.1	28.91.083.1
80*	40	28.67.374.1	28.75.374.1	28.91.090.1
80*	50	28.67.384.1	28.75.384.1	28.91.093.1
100*	40	28.67.394.1	28.75.394.1	
100*	50	28.67.404.1	28.75.404.1	28.91.096.1
100*	80	28.67.414.1	28.75.414.1	28.91.099.1
150*	80	28.67.444.1	28.75.444.1	28.91.102.1
150*	100	28.67.454.1	28.75.454.1	28.91.105.1
200*	100	28.67.464.1	28.75.464.1	28.91.108.1
200*	150	28.67.472.1	28.75.472.1	28.91.111.1

		BNIP
		76.80.31
BRANCH	RUN-PIPE	
15	40-150	882.1
	200-200	884.1
20	40-150	886.1
	200-200	888.1
25	40- 40	889.1
	50- 50	890.1
	80-100	891.1
	150-200	892.1
40	50- 50	894.1
	80- 80	895.1
	100-100	896.1
	150-200	897.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIP	BRANCH FITTING PLAIN-END OUTL.
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.131.1
255	76.83.37.132.1
305	76.83.37.133.1
355	76.83.37.135.1
405	76.83.37.136.1
455	76.83.37.137.1

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET FOR LAP FLANGES

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 60	15	4	1/2	* 70
20	4	1/2	* 70	20	4	1/2	* 70
25	4	1/2	* 70	25	4	1/2	* 80
40	4	1/2	* 80	40	4	1/2	* 80
50	4	5/8	* 80	50	4	5/8	* 90
80	4	5/8	* 100	80	4	5/8	* 100
100	8	5/8	* 100	100	8	5/8	* 100
150	8	3/4	* 100	150	8	3/4	* 110
200	8	3/4	* 110	200	8	3/4	* 120

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.2V	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.06.10.003.1	
BLIND FLANGE		1	76.62.11.058.1	
BLIND FLANGE LINER		1	76.80.81.961.1	
GASKET, RAISED FACE		2	85.48.74.004.1	
LAP-JOINT FLANGE		1	76.65.20.408.1	
STUB-END		1	76.28.54.436.1	
STUD BOLT WITH NUTS		4	81.38.61.153.1	
		4	81.38.61.155.1	

* DRAIN POINT		DN 20	FIG.2V	DN 40 -200
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.06.10.004.1	
BLIND FLANGE		1	76.62.11.062.1	
BLIND FLANGE LINER		1	76.80.81.962.1	
GASKET, RAISED FACE		2	85.48.74.006.1	
LAP-JOINT FLANGE		1	76.65.20.412.1	
STUB-END		1	76.28.54.446.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
		4	81.38.61.155.1	

* PRESSURE INSTR.CONN.		DN 15	FIG.2V	DN 15 -200
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.06.10.003.1	
GASKET, RAISED FACE		2	85.48.74.004.1	
LAP-JOINT FLANGE		2	76.65.20.408.1	
STUB-END		1	76.28.54.436.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	

* TEMPERATURE INSTR.C.		DN 40	FIG.AS	DN 80 - 80
Branch: (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.531.1	
GASKET, RAISED FACE		1	85.48.74.012.1	
LAP-JOINT FLANGE		1	76.65.20.418.1	
PIPE		0	74.78.35.149.1	
STUB-END		1	76.28.54.474.1	
STUD BOLT WITH NUTS		4	81.38.61.157.1	
THERMOWELL STRAIGHT		L=230 MM	1	76.83.37.131.1

* TEMPERATURE INSTR.C.		DN 40	FIG.BS	DN100 -200
Branch: (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.531.1	
GASKET, RAISED FACE		1	85.48.74.012.1	
LAP-JOINT FLANGE		1	76.65.20.418.1	
PIPE		0	74.78.35.149.1	
STUB-END		1	76.28.54.474.1	
STUD BOLT WITH NUTS		4	81.38.61.157.1	
THERMOWELL STRAIGHT		L=255 MM	1	76.83.37.132.1

* VENT POINT		DN 15	FIG.1V	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.11.058.1	
BLIND FLANGE LINER		1	76.80.81.961.1	
GASKET, RAISED FACE		2	85.48.74.004.1	
GLOBE VALVE FLANGED		1	77.36.10.003.1	
LAP-JOINT FLANGE		1	76.65.20.408.1	
STUB-END		1	76.28.54.436.1	
STUD BOLT WITH NUTS		4	81.38.61.153.1	
		4	81.38.61.155.1	

* VENT POINT		DN 20	FIG.1V	DN 40 -200
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.11.062.1	
BLIND FLANGE LINER		1	76.80.81.962.1	
GASKET, RAISED FACE		2	85.48.74.006.1	
GLOBE VALVE FLANGED		1	77.36.10.004.1	
LAP-JOINT FLANGE		1	76.65.20.412.1	
STUB-END		1	76.28.54.446.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
		4	81.38.61.155.1	

CLASS 17010

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 110

PRESSURE BAR GA
DN25 -600 16.0 16.0

NOTES

- - DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED EPOXY RESIN (GRE)
AROMATIC AMINE, HOT CURED, TG > 140 DEG C
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER

TABLE OF SCHEDULES

DN	SCHEDULE
25	.
40	.
50	.
80	.
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRE-AROMATIC AMINE	PLANT	:	
CLASS NO. : 17010	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : O	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 17010, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE,PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: PTFE,PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: LINED BODY MAT,ALUMINIUM LINING: PTFE,PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-600	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17010, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC														

* VALVES															
BALL VALVE RED. BORE FLANGED	77.55.00	055.1	057.1	058.1	060.1	062.1	064.1								
BUTTERFLY VALVE WAFER TYPE	77.60.20			058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.62.00	055.1	057.1	058.1	060.1	062.1	064.1								
* MISCELLANEOUS															
GASKET, RAISED FACE	85.48.10	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17010, REV.O PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
25	8	1/2	*	01	50.112.1
40	8	1/2	*	01	50.112.1
50	8	5/8	*	01	50.114.1
80	8	5/8	*	01	50.114.1
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 17070

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 85

PRESSURE BAR GA
DN25 -300 16.0 16.0

NOTES

- -----
- DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED EPOXY RESIN (GRE)
ALIPHATIC AMINE, HOT CURED, TG > 115 DEG C
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER
- PIPING COMPONENTS FOR POTABLE WATER SERVICE SHALL BE
APPROVED BY LOCAL HEALTH AUTHORITIES

TABLE OF SCHEDULES

DN	SCHEDULE
----	-----
25	.
40	.
50	.
80	.
100	.
150	.
200	.
250	.
300	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRE-ALIPHATIC AMINE	PLANT	:	
CLASS NO. : 17070	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 17070, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE,PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: PTFE,PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: LINED BODY MAT,ALUMINIUM LINING: PTFE,PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-300	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17070, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE								
		25	40	50	80	100	150	200	250	300

* VALVES										
BALL VALVE RED. BORE FLANGED	77.55.00	055.1	057.1	058.1	060.1	062.1	064.1			
BUTTERFLY VALVE WAFER TYPE	77.60.20			058.1	060.1	062.1	064.1	065.1	066.1	067.1
CHECK VALVE FLANGED	77.62.00	055.1	057.1	058.1	060.1	062.1	064.1			
* MISCELLANEOUS										
GASKET, RAISED FACE	85.48.10	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17070, REV.B PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
25	8	1/2	*	01	50.112.1
40	8	1/2	*	01	50.112.1
50	8	5/8	*	01	50.114.1
80	8	5/8	*	01	50.114.1
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1

CLASS 17075

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 85

PRESSURE BAR GA
DN25 -300 16.0 16.0

NOTES

- -----
- DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED EPOXY RESIN (GRE)
ALPHATIC AMINE, HOT CURED, TG > 115 DEG C, ALL EXECUTED WITH
ALUMINIUM FOIL BARRIER
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER
- UNDER GROUND CARBON STEEL COMPONENTS (INCL. BOLTING) SHALL
BE PROTECTED BY A COATING AS PER DEP 30.48.00.31-GEN.
- PIPING COMPONENTS FOR POTABLE WATER SERVICE SHALL BE
APPROVED BY LOCAL HEALTH AUTHORITIES

TABLE OF SCHEDULES

DN	SCHEDULE
----	-----
25	.
40	.
50	.
80	.
100	.
150	.
200	.
250	.
300	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRE-ALIPHATIC AMINE+ALUM FOIL	PLANT :	
CLASS NO. : 17075	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 17075, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE,PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: PTFE,PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: LINED BODY MAT,ALUMINIUM LINING: PTFE,PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-300	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17075, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE								
		25	40	50	80	100	150	200	250	300

* VALVES										
BALL VALVE RED. BORE FLANGED	77.55.00	055.1	057.1	058.1	060.1	062.1	064.1			
BUTTERFLY VALVE WAFER TYPE	77.60.20			058.1	060.1	062.1	064.1	065.1	066.1	067.1
CHECK VALVE FLANGED	77.62.00	055.1	057.1	058.1	060.1	062.1	064.1			
* MISCELLANEOUS										
GASKET, RAISED FACE	85.48.10	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17075, REV.O PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
25	8	1/2	*	01	50.112.1
40	8	1/2	*	01	50.112.1
50	8	5/8	*	01	50.114.1
80	8	5/8	*	01	50.114.1
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1

CLASS 17101

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 85

PRESSURE BAR GA
DN100-600 16.0 16.0

NOTES

- -----
- DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED EPOXY RESIN (GRE)
ALIPHATIC AMINE, HOT CURED, TG > 115 DEG C
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER
- UNDER GROUND CARBON STEEL COMPONENTS (INCL. BOLTING) SHALL
BE PROTECTED BY A COATING AS PER DEP 30.48.00.31-GEN.

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRE-ALIPHATIC AMINE	PLANT	:	
CLASS NO. : 17101	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 17101, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BUVW	BUTTERFLY VALVE WAFER TYPE	DN100-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: CHLOROPRENE RUBBER
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN100-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT,STELLITE 6,FKM
GAVF	GATE VALVE FLANGED	DN100-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN100-600	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17101, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE									
		100	150	200	250	300	350	400	450	500	600

* VALVES											
BUTTERFLY VALVE WAFER TYPE	77.60.11	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.00	512.1	514.1	515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
GATE VALVE FLANGED	77.20.20	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
* MISCELLANEOUS											
GASKET, RAISED FACE	85.48.10	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17101, REV.B PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 17120

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-5 85

PRESSURE BAR GA
DN100-600 16.0 16.0

NOTES

- -----
- DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED EPOXY RESIN (GRE)
ALIPHATIC AMINE, HOT CURED, TG > 115 DEG C
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER
- UNDER GROUND CARBON STEEL COMPONENTS (INCL. BOLTING) SHALL
BE PROTECTED BY A COATING AS PER DEP 30.48.00.31-GEN.

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRE-ALIPHATIC AMINE	PLANT	:	
CLASS NO. : 17120	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 17120, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BUVW	BUTTERFLY VALVE WAFER TYPE	DN100-600	BODY: ASTM A216-WCB/WCC,A105 DISC: ASTM B148 LINING: EPDM (RUBBER)
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN100-600	BODY: ASTM B148 TRIM: ASTM B148/NBR

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN100-600	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17120, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE									
		100	150	200	250	300	350	400	450	500	600

* VALVES											
BUTTERFLY VALVE WAFER TYPE	77.60.01	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
DUAL PL. CHECK VALVE WAFER LUG	77.69.00	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
* MISCELLANEOUS											
GASKET, RAISED FACE	85.48.10	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17120, REV.B PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 17200

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 100

PRESSURE BAR GA
DN25 -600 16.0 16.0

NOTES

- - DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED VINYLESTER RESIN (GRVE)
NOVOLAC-EPOXY, "POST-CURED"
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER

TABLE OF SCHEDULES

DN	SCHEDULE
----	-----
25	.
40	.
50	.
80	.
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRVE-NOVOLAC EPOXY	PLANT :	
CLASS NO. : 17200	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 17200, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE,PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: PTFE,PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: LINED BODY MAT,ALUMINIUM LINING: PTFE,PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-600	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17200, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC														

* VALVES															
BALL VALVE RED. BORE FLANGED	77.55.00	055.1	057.1	058.1	060.1	062.1	064.1								
BUTTERFLY VALVE WAFER TYPE	77.60.20			058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.62.00	055.1	057.1	058.1	060.1	062.1	064.1								
* MISCELLANEOUS															
GASKET, RAISED FACE	85.48.10	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17200, REV.O PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
25	8	1/2	*	01	50.112.1
40	8	1/2	*	01	50.112.1
50	8	5/8	*	01	50.114.1
80	8	5/8	*	01	50.114.1
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 17210

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 100

PRESSURE BAR GA
DN25 -600 16.0 16.0

NOTES

- - DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED VINYLESTER RESIN (GRVE)
NOVOLAC-EPOXY, "POST-CURED"
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
25	.
40	.
50	.
80	.
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRVE-BISPHEENOL A	PLANT	:	
CLASS NO. : 17210	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY :		
CORR. ALL. : 0 mm.	PRINCIPAL :		
REV. LETTER : O	CONTR.JOB NO. :		
REV. DATE : 12/98	PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 17210, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE,PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: PTFE,PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: LINED BODY MAT,ALUMINIUM LINING: PTFE,PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-600	FLUORO-ELASTOMER (FKM) HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17210, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC														

* VALVES															
BALL VALVE RED. BORE FLANGED	77.55.00	055.1	057.1	058.1	060.1	062.1	064.1								
BUTTERFLY VALVE WAFER TYPE	77.60.20			058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.62.00	055.1	057.1	058.1	060.1	062.1	064.1								
* MISCELLANEOUS															
GASKET, RAISED FACE	85.48.11	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17210, REV.O PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
25	8	1/2	*	01	50.112.1
40	8	1/2	*	01	50.112.1
50	8	5/8	*	01	50.114.1
80	8	5/8	*	01	50.114.1
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 17220

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 100

PRESSURE BAR GA
DN25 -600 16.0 16.0

NOTES

- - DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED VINYLESTER RESIN (GRVE)
NOVOLAC-EPOXY, "POST-CURED"
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER

TABLE OF SCHEDULES

DN	SCHEDULE
----	-----
25	.
40	.
50	.
80	.
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRVE-NOVOLAC EPOXY	PLANT :	
CLASS NO. : 17220	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 17220, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE,PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: PTFE,PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: LINED BODY MAT,ALUMINIUM LINING: PTFE,PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-600	BUTYL RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17220, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC														

* VALVES															
BALL VALVE RED. BORE FLANGED	77.55.00	055.1	057.1	058.1	060.1	062.1	064.1								
BUTTERFLY VALVE WAFER TYPE	77.60.20			058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.62.00	055.1	057.1	058.1	060.1	062.1	064.1								
* MISCELLANEOUS															
GASKET, RAISED FACE	85.48.12	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17220, REV.O PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
25	8	1/2	*	01	50.112.1
40	8	1/2	*	01	50.112.1
50	8	5/8	*	01	50.114.1
80	8	5/8	*	01	50.114.1
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 17230

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 80

PRESSURE BAR GA
DN25 -600 16.0 16.0

NOTES

- -----
- DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED VINYLESTER RESIN BISPHENOL A-EPOXY, "POST-CURED"
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS DIFFERS PER MANUFACTURER

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
25	.
40	.
50	.
80	.
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRVE-BISPHENOL A	PLANT	:	
CLASS NO. : 17230	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY :		
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : O	CONTR.JOB NO. :		
REV. DATE : 12/98	PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 17230, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE,PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: PTFE,PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: LINED BODY MAT,ALUMINIUM LINING: PTFE,PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-600	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17230, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC														

* VALVES															
BALL VALVE RED. BORE FLANGED	77.55.00	055.1	057.1	058.1	060.1	062.1	064.1								
BUTTERFLY VALVE WAFER TYPE	77.60.20			058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.62.00	055.1	057.1	058.1	060.1	062.1	064.1								
* MISCELLANEOUS															
GASKET, RAISED FACE	85.48.10	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17230, REV.O PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
25	8	1/2	*	01	50.112.1
40	8	1/2	*	01	50.112.1
50	8	5/8	*	01	50.114.1
80	8	5/8	*	01	50.114.1
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 17310

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 60

PRESSURE BAR GA
DN100-600 10.0 10.0

NOTES

- -----
- DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED POLYESTER RESIN (GRUP)
BISPHENOL, "POST-CURED"
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER
- UNDER GROUND CARBON STEEL COMPONENTS (INCL. BOLTING) SHALL
BE PROTECTED BY A COATING AS PER DEP 30.48.00.31-GEN.

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRUP-ISOPHTHALIC	PLANT	:	
CLASS NO. : 17310	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY :		
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : O	CONTR.JOB NO. :		
REV. DATE : 12/98	PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

* VALVES			
BUVW	BUTTERFLY VALVE WAFER TYPE	DN100-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) LINING: PTFE,PFA
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN100-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT,STELLITE 6,FKM
GAVF	GATE VALVE FLANGED	DN100-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
* MISCELLANEOUS			
GKRF	GASKET, RAISED FACE	DN100-600	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17310, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE									
ITEM DESCRIPTION	MESC	100	150	200	250	300	350	400	450	500	600

* VALVES											
BUTTERFLY VALVE WAFER TYPE	77.60.20	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.00	512.1	514.1	515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
GATE VALVE FLANGED	77.20.20	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
* MISCELLANEOUS											
GASKET, RAISED FACE	85.48.10	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17310, REV.O PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 17320

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-5 60

PRESSURE BAR GA
DN100-600 10.0 10.0

NOTES

- -----
- DESIGN LIMITS ACC.TO NOM.PRESSURE OF VALVES
- PIPING MATERIAL: GLASS REINFORCED POLYESTER RESIN (GRUP)
BISPHENOL, "POST-CURED"
- FOR REQUIREMENTS REGARDING GRP PIPING SYSTEMS, SEE
DEP 31.40.10.19-GEN
- BOLTS FOR GRE FLANGES TO BE PROVIDED WITH WASHERS
- FLANGES TO BE DRILLED ACC. TO ASME B16.5, CLASS 150
- BOLT SETS NOT SHOWN IN PIPING CLASS; FLANGE THICKNESS
DIFFERS PER MANUFACTURER
- UNDER GROUND CARBON STEEL COMPONENTS (INCL. BOLTING) SHALL
BE PROTECTED BY A COATING AS PER DEP 30.48.00.31-GEN.

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
100	.
150	.
200	.
250	.
300	.
350	.
400	.
450	.
500	.
600	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

GRUP-ISOPHTHALIC	PLANT	:	
CLASS NO. : 17320	CONSIGNEE	:	
ANS RATING : CLASS 150	ENGINEERED BY :		
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : O	CONTR.JOB NO. :		
REV. DATE : 12/98	PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 17320, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* VALVES

BUVW	BUTTERFLY VALVE WAFER TYPE	DN100-600	BODY: ASTM A216-WCB/WCC,A105 DISC: ASTM B148 LINING: EPDM (RUBBER)
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN100-600	BODY: ASTM B148 TRIM: ASTM B148/NBR

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN100-600	ETHYLENE PROPYLENE RUBBER HARDNESS 60 SHORE A
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
WABL	WASHER BLACK	---	ASTM A307-B

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 17320, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE								
			100	150	200	250	300	350	400	450	500

* VALVES											
BUTTERFLY VALVE WAFER TYPE	77.60.00	012.1	014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
DUAL PL. CHECK VALVE WAFER LUG	77.69.00	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
* MISCELLANEOUS											
GASKET, RAISED FACE	85.48.10	020.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1	038.1	042.1

BOLTING
BLACK WASHER SET

DEP 31.38.01.12-GEN. CLASS 17320, REV.O PAGE 5
ISSUE DATE : JANUARY 1999

81.78

DN	NR	INCH	*	MM	
100	12	5/8	*	01	50.114.1
150	12	3/4	*	01	50.116.1
200	12	3/4	*	01	50.116.1
250	24	7/8	*	01	50.118.1
300	24	7/8	*	01	50.118.1
350	24	1	*	01	50.120.1
400	32	1	*	01	50.120.1
450	32	1 1/8	*	01	50.121.1
500	40	1 1/8	*	01	50.121.1
600	40	1 1/4	*	01	50.122.1

CLASS 18011

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 100

PRESSURE BAR GA
DN15 -250 16.0 16.0

NOTES

- DESIGN LIMITS ACC.TO VALVE RATING BS5154
- GALVANIZED PIPE AND PIPE SPOOLS MAY BE JOINED BY FIELD WELDS (FOR WET SYSTEMS ONLY).
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- UNDER GROUND CARBON STEEL COMPONENTS (INCL. BOLTING) SHALL BE PROTECTED BY A COATING AS PER DEP 30.48.00.31-GEN.
- FLANGED JOINTS ARE PREFERRED ABOVE THREADED JOINTS.
- FOR PIPES, FITTINGS AND FLANGES, SIZES DN80 AND ABOVE USE CLASS 18101
- AFTER SHOP FABRICATION, PIPE SPOOLS SHALL BE GALVANIZED IN ACCORDANCE TO ASTM A53
- PRE-FABRICATED PIPE SPOOLS SHALL HAVE FLANGED ENDS AND BE LIMITED TO L- OR Z-SHAPES.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE									
	15	20	25	40	50	80	100	150	200	250
250	G	G	I	I	I	I	I	I	I	I
200	G	G	I	I	I	I	I	I	I	
150	G	G	I	I	I	I	I	I		
100	G	G	I	I	I	I	I			
80	G	G	I	I	I	I				
50	R	R	R	R	T					
40	R	R	R	T						
25	R	R	T							
20	R	T								
15	T									

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	.
100	.
150	.
200	.
250	.

CODE EXPLANATION OF CHARACTERS

G	BRANCH FITTING (THREADED)
I	FOR BRANCH CONNECTIONS SEE CLASS 11011
R	REDUCING TEE (THREADED)
T	EQUAL TEE (THREADED)

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL GALVANISED	PLANT :	
CLASS NO. : 18011	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 18011, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15- 50	API 5L-B (GALVANISED)
PNTT	PIPE NIPPLE THRD. ENDS L= 50MM	DN 15- 25	API 5L-B (GALVANISED)
PT75	PIPE NIPPLE THRD. ENDS L= 75MM	DN 15- 50	API 5L-B (GALVANISED)
PT99	PIPE NIPPLE THRD. ENDS L=100MM	DN 15- 50	API 5L-B (GALVANISED)

* FLANGES

BLFL	BLIND FLANGE	DN 15-250	ASTM A105 (GALVANISED)

* FITTINGS

CAPT	CAP THREADED	DN 15-100	ASTM A234-WPB (GALVANISED)
COUT	COUPLING THREADED ENDS	DN 15-100	ASTM A234-WPB (GALVANISED)
E45T	ELBOW 45DEG. THREADED ENDS	DN 15-100	ASTM A234-WPB (GALVANISED)
E90T	ELBOW 90DEG. THREADED ENDS	DN 15-100	ASTM A234-WPB (GALVANISED)
PLUG	PLUG NPT	DN 15-100	ASTM A234-WPB (GALVANISED)
TEET	TEE THREADED ENDS	DN 15-100	ASTM A234-WPB (GALVANISED)
UNIT	UNION THREADED END	DN 15-100	ASTM A234-WPB (GALVANISED)

* REDUCING FITTINGS

REBU	REDUCED BUSHING THRD. ENDS	DN 20-100	ASTM A234-WPB (GALVANISED)
RECT	REDUCER CONC. THRD. ENDS	DN 20-100	ASTM A234-WPB (GALVANISED)
TERT	TEE REDUCING THREADED ENDS	DN 20-100	ASTM A234-WPB (GALVANISED)

* VALVES

BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-250	BODY: ASTM A216-WCB/WCC,A105 DISC: ASTM B148 LINING: EPDM (RUBBER)
CHVT	CHECK VALVE THREADED ENDS	DN 15- 50	BODY/TRIM: ASTM B148
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-250	BODY: ASTM B148 TRIM: ASTM B148/PTFE,FKM
GAVP	GATE VALVE FLANGED FLAT FACE	DN 15- 80	BODY: ASTM B148 TRIM: ASTM B148
GAVT	GATE VALVE THREADED ENDS	DN 15- 50	BODY: ASTM B148 TRIM: ASTM B148
GLVT	GLOBE VALVE THREADED ENDS	DN 15- 50	BODY: ASTM B148 TRIM: ASTM B148

* MISCELLANEOUS

GKGF	GASKET GRAPHITE FULL FACE	DN 15-250	GRAPHITE
GKTI	GASKET, RF TANGED INSERT	DN 15-250	GRAPHITE
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 18011, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE									
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250

* PIPE											
PIPE											
PIPE NIPPLE THRD. ENDS L= 50MM	74.13.08	018.1	023.1	028.1	038.1	043.1					
PIPE NIPPLE THRD. ENDS L= 75MM	76.06.56	092.1	132.1	172.1							
PIPE NIPPLE THRD. ENDS L= 75MM	76.06.56	093.1	133.1	173.1	193.1	213.1					
PIPE NIPPLE THRD. ENDS L=100MM	76.06.56	094.1	134.1	174.1	194.1	214.1					
* FLANGES											
BLIND FLANGE	76.62.15	008.1	012.1	016.1	018.1	020.1	022.1	024.1	026.1	028.1	030.1
FLANGE THREADED	76.62.50	758.1	762.1	766.1	768.1	770.1	772.1	774.1			
* FITTINGS											
CAP THREADED	76.06.18	008.1	012.1	016.1	018.1	020.1	022.1	024.1			
COUPLING THREADED ENDS	76.06.28	008.1	012.1	016.1	018.1	020.1	022.1	024.1			
ELBOW 45DEG. THREADED ENDS	76.06.38	008.1	012.1	016.1	018.1	020.1	022.1	024.1			
ELBOW 90DEG. THREADED ENDS	76.06.39	008.1	012.1	016.1	018.1	020.1	022.1	024.1			
PLUG NPT	76.06.66	008.1	012.1	016.1	018.1	020.1	022.1	024.1			
TEE THREADED ENDS	76.06.84	008.1	012.1	016.1	018.1	020.1	022.1	024.1			
UNION THREADED END	76.06.91	008.1	012.1	016.1	018.1	020.1	022.1	024.1			
* VALVES											
BUTTERFLY VALVE WAFER TYPE	77.60.00					058.1	060.1	062.1	064.1	065.1	066.1
CHECK VALVE THREADED ENDS	77.17.01	003.1	004.1	005.1	007.1	008.1					
DUAL PL. CHECK VALVE WAFER LUG	77.69.00					008.1	010.1	012.1	014.1	015.1	016.1
GATE VALVE FLANGED FLAT FACE	77.26.01	003.1	004.1	005.1	007.1	008.1	010.1				
GATE VALVE THREADED ENDS	77.27.01	003.1	004.1	005.1	007.1	008.1					
GLOBE VALVE THREADED ENDS	77.37.01	003.1	004.1	005.1	007.1	008.1					
* MISCELLANEOUS											
GASKET GRAPHITE FULL FACE	85.30.01	404.1	406.1	408.1	412.1	414.1	418.1	420.1	424.1	426.1	428.1
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1	026.1	028.1

REDUCING/PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 18011, REV.B PAGE 4
ISSUE DATE : JANUARY 1999

		REBU	RECT	REFT	TERT
		76.	76.	76.	76.
RUN*	BR				

20*	15	06.14.122.1	06.70.122.1	62.61.130.1	06.85.026.1
25*	15	06.14.162.1	06.70.162.1	62.61.140.1	06.85.034.1
25*	20	06.14.164.1	06.70.164.1	62.61.142.1	06.85.036.1
40*	15	06.14.181.1	06.70.181.1	62.61.160.1	06.85.044.1
40*	20	06.14.183.1	06.70.183.1	62.61.161.1	06.85.046.1
40*	25	06.14.185.1	06.70.185.1	62.61.163.1	06.85.048.1
50*	15	06.14.200.1	06.70.200.1	62.61.180.1	06.85.054.1
50*	20	06.14.201.1	06.70.201.1	62.61.182.1	06.85.056.1
50*	25	06.14.202.1	06.70.202.1	62.61.184.1	06.85.058.1
50*	40	06.14.204.1	06.70.204.1	62.61.186.1	06.85.060.1
80*	15			62.61.200.1	
80*	20			62.61.202.1	
80*	25	06.14.222.1	06.70.222.1	62.61.204.1	06.85.068.1
80*	40	06.14.224.1	06.70.224.1	62.61.206.1	06.85.070.1
80*	50	06.14.225.1	06.70.225.1	62.61.208.1	06.85.072.1
100*	15			62.61.210.1	
100*	20			62.61.212.1	
100*	25			62.61.214.1	
100*	40	06.14.241.1	06.70.241.1	62.61.216.1	06.85.076.1
100*	50	06.14.242.1	06.70.242.1	62.61.218.1	06.85.078.1
100*	80	06.14.244.1	06.70.244.1	62.61.220.1	06.85.080.1

COMP.
NAME DESCRIPTION

REBU REDUCED BUSHING THRD. ENDS
RECT REDUCER CONC. THRD. ENDS
REFT REDUCING FLANGE THREADED END
TERT TEE REDUCING THREADED ENDS

BOLTING
BOLTSET BS5155 BFLY VALVE

BOLTSET FLANGED JOINTS

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
-----					-----				
					15	4	1/2	*	60
					20	4	1/2	*	70
					25	4	1/2	*	70
					40	4	1/2	*	80
50	4	5/8	*	130	50	4	5/8	*	80
80	4	5/8	*	150	80	4	5/8	*	100
100	8	5/8	*	150	100	8	5/8	*	100
150	8	3/4	*	160	150	8	3/4	*	100
200	8	3/4	*	170	200	8	3/4	*	110
250	12	7/8	*	190	250	12	7/8	*	120

BOLTSET SPECTACLE/SPACER

81.38				
DN	NR	INCH	*	MM

15	4	1/2	*	70
20	4	1/2	*	70
25	4	1/2	*	80
40	4	1/2	*	80
50	4	5/8	*	90
80	4	5/8	*	110
100	8	5/8	*	110
150	8	3/4	*	120
200	8	3/4	*	130
250	12	7/8	*	140

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.0C	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1(PIPING COMP.)		
CAP THREADED		1	76.06.18.008.1	
GATE VALVE THREADED ENDS		1	77.27.01.003.1	
PIPE NIPPLE THRD. ENDS L= 50MM		2	76.06.56.092.1	
* DRAIN POINT		DN 20	FIG.0C	DN 40 - 50
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1(PIPING COMP.)		
CAP THREADED		1	76.06.18.012.1	
GATE VALVE THREADED ENDS		1	77.27.01.004.1	
PIPE NIPPLE THRD. ENDS L= 50MM		2	76.06.56.132.1	
* DRAIN POINT		DN 20	FIG.6A	DN 80 -250
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1(PIPING COMP.)		
CAP THREADED		1	76.06.18.012.1	
GATE VALVE THREADED ENDS		1	77.27.01.004.1	
PIPE NIPPLE THRD. ENDS L= 50MM		1	76.06.56.132.1	
* PRESSURE INSTR.CONN.		DN 15	FIG.6C	DN 15 - 50
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1(PIPING COMP.)		
FLANGE THREADED		1	76.62.50.758.1	
GASKET, RF TANGED INSERT		1	85.30.01.004.1	
GATE VALVE THREADED ENDS		1	77.27.01.003.1	
LAP-JOINT FLANGE		1	76.62.23.208.1	
PIPE NIPPLE THRD. ENDS L= 50MM		2	76.06.56.092.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
* PRESSURE INSTR.CONN.		DN 15	FIG.6D	DN 80 -250
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1(PIPING COMP.)		
FLANGE THREADED		1	76.62.50.758.1	
GASKET, RF TANGED INSERT		1	85.30.01.004.1	
GATE VALVE THREADED ENDS		1	77.27.01.003.1	
LAP-JOINT FLANGE		1	76.62.23.208.1	
PIPE NIPPLE THRD. ENDS L= 50MM		1	76.06.56.092.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	

* VENT POINT		DN 15	FIG.1C	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1(PIPING COMP.)		
CAP THREADED		1	76.06.18.008.1	
GLOBE VALVE THREADED ENDS		1	77.37.01.003.1	
PIPE NIPPLE THRD. ENDS L= 50MM		2	76.06.56.092.1	
* VENT POINT		DN 20	FIG.1C	DN 40 - 50
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1(PIPING COMP.)		
CAP THREADED		1	76.06.18.012.1	
GLOBE VALVE THREADED ENDS		1	77.37.01.004.1	
PIPE NIPPLE THRD. ENDS L= 50MM		2	76.06.56.132.1	
* VENT POINT		DN 20	FIG.6A	DN 80 -250
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1(PIPING COMP.)		
CAP THREADED		1	76.06.18.012.1	
GLOBE VALVE THREADED ENDS		1	77.37.01.004.1	
PIPE NIPPLE THRD. ENDS L= 50MM		1	76.06.56.132.1	

CLASS 18040

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 80

PRESSURE BAR GA
DN25 -300 10.0 10.0

NOTES

- -----
- DESIGN LIMITS ACC.TO VALVE RATING
- FOR RUBBER-LINED PIPING SEE DEP 30.48.60.10-GEN AND
STD DWG S38.080/081/082/083/085

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
25	40
40	40
50	40
80	40
100	40
150	40
200	20

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL RUBBER-LINED	PLANT :	
CLASS NO. : 18040	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 18040, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 25-200	ASTM A106-B

* FLANGES

BLFM	BLIND FLANGE MODIFIED	DN 25-200	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	DN 40- 40	ASTM A105
WNFM	WELDING NECK FLANGE MODIFIED	DN 25-200	ASTM A105

* FITTINGS

E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 25-200	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 25-200	ASTM A234-WPB
SP12	SPACER STRAIGHT L= 12	DN 25-200	ASTM A285-C
SP18	SPACER STRAIGHT L= 18	DN 25-200	ASTM A285-C
SP25	SPACER STRAIGHT L= 25	DN 25-200	ASTM A285-C
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 25-200	ASTM A234-WPB

* REDUCING FITTINGS

BRPW	BRANCH PIECE, WAFER TYPE	DN 80-300	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 40-200	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 40-200	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 40-200	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-200	BODY: ASTM A216-WCB/WCC,A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE,PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-200	BODY: ASTM A216-WCB/WCC,A105 DISC: ASTM B148 LINING: EPDM (RUBBER)
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC,A105 BALL: LINED BODY MAT,ALUMINIUM LINING: PTFE,PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-200	PTFE REINF.WITH MINERAL FILLER
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	STEM : ASTM B335 UNS N10665 FLANGE: ASTM B333 UNS N10665

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE						
		25	40	50	80	100	150	200

* PIPE								
PIPE	74.30.05	036.1	056.1	069.1	103.1	149.1	211.1	239.1
* FLANGES								
BLIND FLANGE MODIFIED	76.88.22	008.1	010.1	012.1	016.1	018.1	024.1	028.1
COVER FLANGE THERMOWELL NOZZLE	76.62.60		531.1					
WELDING NECK FLANGE MODIFIED	76.88.22	106.1	108.1	112.1	116.1	118.1	124.1	127.1
* FITTINGS								
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	581.1	587.1	605.1	625.1	645.1	665.1	682.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	581.1	587.1	605.1	625.1	645.1	665.1	682.1
SPACER STRAIGHT L= 12	76.82.68	001.1	002.1	004.1	006.1	008.1	010.1	012.1
SPACER STRAIGHT L= 18	76.82.68	030.1	032.1	034.1	036.1	038.1	040.1	042.1
SPACER STRAIGHT L= 25	76.82.68	060.1	062.1	064.1	066.1	068.1	070.1	072.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	581.1	587.1	605.1	625.1	645.1	665.1	682.1
* VALVES								
BALL VALVE RED. BORE FLANGED	77.55.00	005.1	007.1	008.1	010.1	012.1	014.1	015.1
BUTTERFLY VALVE WAFER TYPE	77.60.00			008.1	010.1	012.1	014.1	015.1
CHECK VALVE FLANGED	77.62.00	005.1	007.1	008.1	010.1	012.1	014.1	015.1
* MISCELLANEOUS								
GASKET, RAISED FACE	85.48.74	008.1	012.1	014.1	018.1	020.1	024.1	026.1

	BRPW	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
40* 25		30.72.185.1	30.73.218.1	30.89.084.1
50* 25		30.72.204.1	30.73.204.1	30.89.105.1
50* 40		30.72.205.1	30.73.205.1	30.89.114.1
80* 25	82.68.106.1			
80* 40	82.68.136.1	30.72.225.1	30.73.225.1	30.89.123.1
80* 50		30.72.235.1	30.73.235.1	30.89.132.1
100* 25	82.68.108.1			
100* 40	82.68.138.1	30.72.245.1	30.73.245.1	
100* 50		30.72.265.1	30.73.265.1	30.89.153.1
100* 80		30.72.275.1	30.73.275.1	30.89.165.1
150* 25	82.68.110.1			
150* 40	82.68.140.1			
150* 80		30.72.295.1	30.73.295.1	30.89.177.1
150*100		30.72.305.1	30.73.305.1	30.89.189.1
200* 25	82.68.112.1			
200* 40	82.68.142.1			
200*100		30.72.322.1	30.73.322.1	30.89.210.1
200*150		30.72.333.1	30.73.333.1	30.89.230.1
250* 25	82.68.114.1			
250* 40	82.68.144.1			
300* 25	82.68.116.1			
300* 40	82.68.146.1			

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.131.1
255	76.83.37.132.1
305	76.83.37.133.1
355	76.83.37.135.1
405	76.83.37.136.1
455	76.83.37.137.1

COMP.	
NAME	DESCRIPTION
BRPW	BRANCH PIECE, WAFER TYPE
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET BRANCH PIECE BOLTSET FLANGED JOINTS

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ISSUE DATE : JANUARY 1999

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	

						25	4	1/2	*	70	61.155.1
						40	4	1/2	*	80	61.157.1
						50	4	5/8	*	80	61.269.1
80	4	5/8	*	170	61.284.1	80	4	5/8	*	100	61.273.1
100	8	5/8	*	170	61.284.1	100	8	5/8	*	100	61.273.1
150	8	3/4	*	170	61.340.1	150	8	3/4	*	100	61.329.1
200	8	3/4	*	180	61.341.1	200	8	3/4	*	110	61.330.1

BOLTSET SPACER L=12 BOLTSET SPACER L=18

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	

25	4	1/2	*	90	61.159.1	25	4	1/2	*	90	61.159.1
40	4	1/2	*	90	61.159.1	40	4	1/2	*	100	61.161.1
50	4	5/8	*	100	61.273.1	50	4	5/8	*	100	61.273.1
80	4	5/8	*	110	61.274.1	80	4	5/8	*	120	61.276.1
100	8	5/8	*	110	61.274.1	100	8	5/8	*	120	61.276.1
150	8	3/4	*	120	61.332.1	150	8	3/4	*	120	61.332.1
200	8	3/4	*	130	61.334.1	200	8	3/4	*	130	61.334.1

BOLTSET SPACER L= 25

81.38					
DN	NR	INCH	*	MM	

25	4	1/2	*	100	61.161.1
40	4	1/2	*	100	61.161.1
50	4	5/8	*	110	61.274.1
80	4	5/8	*	120	61.276.1
100	8	5/8	*	120	61.276.1
150	8	3/4	*	130	61.334.1
200	8	3/4	*	140	61.335.1

CLASS 18070

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 100

PRESSURE BAR GA
DN25 -200 16.0 16.0

NOTES

- - DESIGN LIMITS ACC.TO VALVE RATING
- THE FOLLOWING REDUCING FLANGES ARE, AT THE -LARGE SIDE-
PROVIDED WITH TAPHOLES 40 * 25 80 * 40 150 * 100
50 * 25 80 * 50 200 * 150
50 * 40 100 * 80
USE BOLTSET "LARGE SIDE TAP" FOR THESE FLANGES. USE BOLTSET
"LARGE SIDE FL.", FOR ALL OTHER SIZE COMBINATIONS.
- FOR LINED PIPING SEE DEP 30.48.50.12-GEN AND
STD DWG S38.150/151/152/153

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
25	40
40	40
50	40
80	40
100	40
150	40
200	20

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL POLYPROP-LINED	PLANT :	
CLASS NO. : 18070	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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* FLANGES

BLFL	BLIND FLANGE	DN 25-200	ASTM A105
FLIN	BLIND FLANGE LINER	DN 25-200	ASTM D4101 (POLYPROPYLENE)

* FITTINGS

CREL	CROSS EQUAL	DN 25-200	ASTM A234-WPB (PP-LINED)
E45L	ELBOW 45DEG.	DN 25-200	ASTM A234-WPB (PP-LINED)
E90L	ELBOW 90DEG.	DN 25-200	ASTM A234-WPB (PP-LINED)
TEEL	EQUAL TEE	DN 25-200	ASTM A234-WPB (PP-LINED)

* REDUCING FITTINGS

BRPL	BRANCH PIECE, WAFER TYPE, LINED	DN 40-200	ASTM A106-B (PP-LINED)
RECL	REDUCER CONCENTRIC, LINED.	DN 40-200	ASTM A234-WPB (PP-LINED)
REEL	REDUCER ECCENTRIC, LINED.	DN 40-200	ASTM A234-WPB (PP-LINED)
REFL	REDUCING FLANGE, LINED.	DN 40-200	ASTM A105 (PP-LINED)
TERL	REDUCING TEE, LINED.	DN 40-200	ASTM A234-WPB (PP-LINED)

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-200	BODY: ASTM A216-WCB/WCC, A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE, PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-200	BODY: ASTM A216-WCB/WCC, A105 TRIM: AISI 316 (L) LINING: PTFE, PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC, A105 BALL: LINED BODY MAT, ALUMINIUM LINING: PTFE, PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-200	PTFE REINF. WITH MINERAL FILLER
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE						
		25	40	50	80	100	150	200

* FLANGES								
BLIND FLANGE	76.62.11	066.1	068.1	070.1	072.1	074.1	076.1	078.1
BLIND FLANGE LINER	76.80.81	903.1	905.1	906.1	907.1	908.1	910.1	911.1
* FITTINGS								
CROSS EQUAL	76.93.30	106.1	110.1	112.1	116.1	118.1	122.1	124.1
ELBOW 45DEG.	76.93.38	106.1	110.1	112.1	116.1	118.1	122.1	124.1
ELBOW 90DEG.	76.93.39	106.1	110.1	112.1	116.1	118.1	122.1	124.1
EQUAL TEE	76.93.84	106.1	110.1	112.1	116.1	118.1	122.1	124.1
* VALVES								
BALL VALVE RED. BORE FLANGED	77.55.00	055.1	057.1	058.1	060.1	062.1	064.1	065.1
BUTTERFLY VALVE WAFER TYPE	77.60.20			058.1	060.1	062.1	064.1	065.1
CHECK VALVE FLANGED	77.62.00	055.1	057.1	058.1	060.1	062.1	064.1	065.1
* MISCELLANEOUS								
GASKET, RAISED FACE	85.48.74	008.1	012.1	014.1	018.1	020.1	024.1	026.1

		BRPL	RECL	REEL	REFL	TERL
		76.	76.	76.	76.	76.
RUN*	BR					
40*	25	93.11.110.1	93.70.104.1	93.71.104.1	93.95.106.1	93.85.106.1
50*	25	93.11.112.1	93.70.108.1	93.71.108.1	93.95.110.1	93.85.110.1
50*	40	93.11.114.1	93.70.112.1	93.71.112.1	93.95.112.1	93.85.112.1
80*	25	93.11.116.1			93.95.114.1	93.85.114.1
80*	40	93.11.118.1	93.70.126.1	93.71.126.1	93.95.116.1	93.85.116.1
80*	50		93.70.128.1	93.71.128.1	93.95.118.1	93.85.118.1
100*	25	93.11.120.1			93.95.120.1	93.85.120.1
100*	40	93.11.122.1			93.95.122.1	93.85.122.1
100*	50		93.70.138.1	93.71.138.1	93.95.124.1	93.85.124.1
100*	80		93.70.142.1	93.71.142.1	93.95.126.1	93.85.126.1
150*	25	93.11.126.1			93.95.134.1	93.85.134.1
150*	40	93.11.128.1			93.95.136.1	93.85.136.1
150*	50				93.95.138.1	93.85.138.1
150*	80		93.70.154.1	93.71.154.1	93.95.140.1	93.85.140.1
150*	100		93.70.156.1	93.71.156.1	93.95.142.1	93.85.142.1
200*	25	93.11.136.1			93.95.144.1	93.85.144.1
200*	40	93.11.138.1			93.95.146.1	93.85.146.1
200*	50				93.95.148.1	93.85.148.1
200*	80				93.95.150.1	93.85.150.1
200*	100		93.70.170.1	93.71.170.1	93.95.152.1	93.85.152.1
200*	150		93.70.172.1	93.71.172.1	93.95.154.1	93.85.154.1

COMP.	
NAME	DESCRIPTION
BRPL	BRANCH PIECE, WAFER TYPE, LINED
RECL	REDUCER CONCENTRIC, LINED.
REEL	REDUCER ECCENTRIC, LINED.
REFL	REDUCING FLANGE, LINED.
TERL	REDUCING TEE, LINED.

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BOLTS RED.FLG. S.SIDE -P						BOLTS.RED.FLG. L.S.FLG.-P						BOLTS.RED.FLG. L.S.TAP -P						BOLTSET BRANCH PIECES -P						BOLTSET FLANGED JOINT -P					
81.38						81.38						81.38						81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
25	4	1/2	*	70	61.155.1													25	4	1/2	*	150	61.169.1	25	4	1/2	*	80	61.157.1
40	4	1/2	*	80	61.157.1	40	4	1/2	*	100	61.161.1	40	4	1/2	*	90	61.159.1	40	4	1/2	*	160	61.171.1	40	4	1/2	*	90	61.159.1
50	4	5/8	*	90	61.271.1	50	4	5/8	*	110	61.274.1	50	4	5/8	*	100	61.273.1	50	4	5/8	*	170	61.284.1	50	4	5/8	*	100	61.273.1
80	4	5/8	*	100	61.273.1	80	4	5/8	*	120	61.276.1	80	4	5/8	*	110	61.274.1	80	4	5/8	*	190	61.287.1	80	4	5/8	*	110	61.274.1
100	8	5/8	*	100	61.273.1	100	8	5/8	*	130	61.278.1	100	8	5/8	*	120	61.276.1	100	8	5/8	*	190	61.287.1	100	8	5/8	*	110	61.274.1
150	8	3/4	*	110	61.330.1	150	8	3/4	*	140	61.335.1	150	8	3/4	*	120	61.332.1	150	8	3/4	*	210	61.346.1	150	8	3/4	*	130	61.334.1
						200	8	3/4	*	150	61.337.1	200	8	3/4	*	130	61.334.1	200	8	3/4	*	220	61.348.1	200	8	3/4	*	140	61.335.1

CLASS 18081

DESIGN LIMITS								
TEMPERATURE IN DEGREES CELSIUS								
	0	50	75	100	125	150	175	200

PRESSURE BAR GA								
DN15 -50	19.7	19.7	18.5	17.7	16.7	15.8	14.9	11.0

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES					
BRANCHSIZE					
RUN SIZE	20		40		
	15	25	50		

50	R	R	R	R	T
40	R	R	R	T	
25	R	R	T		
20	R	T			
15	T				

TABLE OF SCHEDULES	
DN	SCHEDULE

15	80
20	80
25	80
40	80
50	80

CODE	EXPLANATION OF CHARACTERS

R	REDUCING TEE (THREADED)
T	EQUAL TEE (THREADED)

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL GALVANISED	PLANT :	
CLASS NO. : 18081	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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* PIPE

PIPE	PIPE	DN 15-	50	API 5L-B (GALVANISED)
PNTT	PIPE NIPPLE THRD. ENDS L= 50MM	DN 15-	25	API 5L-B (GALVANISED)
PT75	PIPE NIPPLE THRD. ENDS L= 75MM	DN 15-	50	API 5L-B (GALVANISED)
PT99	PIPE NIPPLE THRD. ENDS L=100MM	DN 15-	50	API 5L-B (GALVANISED)

* FITTINGS

CAPT	CAP THREADED	DN 15-100	ASTM A234-WPB (GALVANISED)
COUT	COUPLING THREADED ENDS	DN 15-100	ASTM A234-WPB (GALVANISED)
E45T	ELBOW 45DEG. THREADED ENDS	DN 15-100	ASTM A234-WPB (GALVANISED)
E90T	ELBOW 90DEG. THREADED ENDS	DN 15-100	ASTM A234-WPB (GALVANISED)
PLUG	PLUG NPT	DN 15-100	ASTM A234-WPB (GALVANISED)
TEET	TEE THREADED ENDS	DN 15-100	ASTM A234-WPB (GALVANISED)
UNIT	UNION THREADED END	DN 15-100	ASTM A234-WPB (GALVANISED)

* REDUCING FITTINGS

REBU	REDUCED BUSHING THRD. ENDS	DN 20-100	ASTM A234-WPB (GALVANISED)
RECT	REDUCER CONC. THRD. ENDS	DN 20-100	ASTM A234-WPB (GALVANISED)
TERT	TEE REDUCING THREADED ENDS	DN 20-100	ASTM A234-WPB (GALVANISED)

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-	50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
BART	BALL VALVE RED.BORE THREADED	DN 15-	40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-	40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-	50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHVT	CHECK VALVE THREADED ENDS	DN 15-	40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15-	40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVT	GLOBE VALVE THREADED ENDS	DN 15-	40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-	50	GRAPHITE
STBT	STUD BOLT WITH NUTS	---		ASTM A193-B7/A194-2H

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE							
		15	20	25	40	50	80	100	

* PIPE									
PIPE	74.13.08	018.1	023.1	028.1	038.1	043.1			
PIPE NIPPLE THRD. ENDS L= 50MM	76.06.56	092.1	132.1	172.1					
PIPE NIPPLE THRD. ENDS L= 75MM	76.06.56	093.1	133.1	173.1	193.1	213.1			
PIPE NIPPLE THRD. ENDS L=100MM	76.06.56	094.1	134.1	174.1	194.1	214.1			
* FLANGES									
FLANGE THREADED	76.62.50	758.1	762.1	766.1	768.1	770.1			
* FITTINGS									
CAP THREADED	76.06.18	008.1	012.1	016.1	018.1	020.1	022.1	024.1	
COUPLING THREADED ENDS	76.06.28	008.1	012.1	016.1	018.1	020.1	022.1	024.1	
ELBOW 45DEG. THREADED ENDS	76.06.38	008.1	012.1	016.1	018.1	020.1	022.1	024.1	
ELBOW 90DEG. THREADED ENDS	76.06.39	008.1	012.1	016.1	018.1	020.1	022.1	024.1	
PLUG NPT	76.06.66	008.1	012.1	016.1	018.1	020.1	022.1	024.1	
TEE THREADED ENDS	76.06.84	008.1	012.1	016.1	018.1	020.1	022.1	024.1	
UNION THREADED END	76.06.91	008.1	012.1	016.1	018.1	020.1	022.1	024.1	
* VALVES									
BALL VALVE RED. BORE FLANGED	77.00.03	003.1	004.1	005.1	007.1	008.1			
BALL VALVE RED.BORE THREADED	77.01.00	003.1	004.1	005.1	007.1				
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1				
	77.10.20					008.1			
CHECK VALVE THREADED ENDS	77.11.01	003.1	004.1	005.1	007.1				
GLOBE VALVE FLANGED	77.30.05	003.1	004.1	005.1	007.1				
GLOBE VALVE THREADED ENDS	77.31.01	003.1	004.1	005.1	007.1				
* MISCELLANEOUS									
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1			

REDUCING/PIPING COMPONENTS

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		REBU	RECT	REFT	TERT
		76.	76.	76.	76.
RUN*	BR				
20*	15	06.14.122.1	06.70.122.1	62.61.130.1	06.85.026.1
25*	15	06.14.162.1	06.70.162.1	62.61.140.1	06.85.034.1
25*	20	06.14.164.1	06.70.164.1	62.61.142.1	06.85.036.1
40*	15	06.14.181.1	06.70.181.1	62.61.160.1	06.85.044.1
40*	20	06.14.183.1	06.70.183.1	62.61.161.1	06.85.046.1
40*	25	06.14.185.1	06.70.185.1	62.61.163.1	06.85.048.1
50*	15	06.14.200.1	06.70.200.1	62.61.180.1	06.85.054.1
50*	20	06.14.201.1	06.70.201.1	62.61.182.1	06.85.056.1
50*	25	06.14.202.1	06.70.202.1	62.61.184.1	06.85.058.1
50*	40	06.14.204.1	06.70.204.1	62.61.186.1	06.85.060.1
80*	25	06.14.222.1	06.70.222.1		06.85.068.1
80*	40	06.14.224.1	06.70.224.1		06.85.070.1
80*	50	06.14.225.1	06.70.225.1		06.85.072.1
100*	40	06.14.241.1	06.70.241.1		06.85.076.1
100*	50	06.14.242.1	06.70.242.1		06.85.078.1
100*	80	06.14.244.1	06.70.244.1		06.85.080.1

COMP.	
NAME	DESCRIPTION
----	-----
REBU	REDUCED BUSHING THRD. ENDS
RECT	REDUCER CONC. THRD. ENDS
REFT	REDUCING FLANGE THREADED END
TERT	TEE REDUCING THREADED ENDS

BOLTING
BOLTSET FLANGED JOINTS

81.38					
DN	NR	INCH	*	MM	
15	4	1/2	*	60	61.153.1
20	4	1/2	*	70	61.155.1
25	4	1/2	*	70	61.155.1
40	4	1/2	*	80	61.157.1
50	4	5/8	*	80	61.269.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.2C DN 15 - 25
 Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
 BALL VALVE RED.BORE THREADED 1 77.01.00.003.1
 CAP THREADED 1 76.06.18.008.1
 PIPE NIPPLE THRD. ENDS L= 50MM 2 76.06.56.092.1

* DRAIN POINT DN 20 FIG.2A DN 40 - 50
 Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
 BALL VALVE RED.BORE THREADED 1 77.01.00.004.1
 CAP THREADED 1 76.06.18.012.1
 PIPE NIPPLE THRD. ENDS L= 50MM 1 76.06.56.132.1

* PRESSURE INSTR.CONN. DN 15 FIG.2C DN 15 - 50
 Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
 BALL VALVE RED.BORE THREADED 1 77.01.00.003.1
 FLANGE THREADED 1 76.62.50.758.1
 GASKET, RF TANGED INSERT 1 85.30.01.004.1
 LAP-JOINT FLANGE 1 76.62.23.208.1
 PIPE NIPPLE THRD. ENDS L= 50MM 2 76.06.56.092.1
 STUD BOLT WITH NUTS 4 81.38.61.155.1

* VENT POINT DN 15 FIG.1C DN 15 - 25
 Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
 CAP THREADED 1 76.06.18.008.1
 GLOBE VALVE THREADED ENDS 1 77.31.01.003.1
 PIPE NIPPLE THRD. ENDS L= 50MM 2 76.06.56.092.1

* VENT POINT DN 20 FIG.1C DN 40 - 50
 Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
 CAP THREADED 1 76.06.18.012.1
 GLOBE VALVE THREADED ENDS 1 77.31.01.004.1
 PIPE NIPPLE THRD. ENDS L= 50MM 2 76.06.56.132.1

CLASS 18101

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 60

PRESSURE BAR GA
DN15 -400 16.0 16.0

NOTES

- -----
- DESIGN LIMITS ACC.TO BS5155 BUTTERFLY VALVE RATING
- AFTER SHOP FABRICATION, PIPE SPOOLS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A53.
- PRE-FABRICATED PIPE SPOOLS SHALL HAVE FLANGED ENDS AND BE LIMITED TO L- OR Z-SHAPES.
- FOR SPRAY-ASSEMBLY BRANCH SEE ASSEMBLY TABLES, BRANCH FITT. THREADED TO BE USED AT SHOP FABRICATION OF PIPING.
- SPRAY-NOZZLE SELECTION TO MEET THE FOLLOWING :
 - MATERIAL : AISI 316 OR MONEL-400.
 - NOM. SIZE: 15 OR 20 NPT MALE THREADED.
 - SUPPLIER : TO BE APPROVED BY PRINCIPAL.
- DRAIN HOLES (6 MM.) TO BE DRILLED BEFORE GALVANIZING.
- FOR GENERAL INFO SEE DEP 80.47.10.31-GEN.
- FOR PIPES, FITTINGS AND FLANGES, SIZES DN50 AND SMALLER USE CLASS 18011
- API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE									
	15	20	80	100	150	200	250	300	350	400
400	G	G	D	D	D	D	D	D	D	A
350	G	G	D	D	D	D	D	D	A	
300	G	G	D	D	D	D	D	A		
250	G	G	D	D	D	D	A			
200	G	G	D	D	D	A				
150	G	G	D	D	A					
100	G	G	D	A						
80	G	G	A							

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
80	40
100	40
150	40
200	20
250	20
300	20
350	20
400	20

CODE	EXPLANATION OF CHARACTERS
----	-----
A	EQUAL TEE
D	PIPE TO PIPE
G	BRANCH FITTING (THREADED)

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL GALVANIZED	PLANT :	
CLASS NO. : 18101	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-400	API 5L-B (WLD)
PIPE	PIPE	DN 15-400	ASTM A106-B
PNTT	PIPE NIPPLE THRD. ENDS L= 50MM	---	API 5L-B (GALVANISED)

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105 (GALVANISED)
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
COUT	COUPLING THREADED ENDS	---	ASTM A234-WPB (GALVANISED)
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90T	ELBOW 90DEG. THREADED ENDS	---	ASTM A234-WPB (GALVANISED)
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIT	BRANCH FITTING THREADED OUTLET	DN 15- 50	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

BARP	BALL VALVE RED.BORE FLANGED FF	DN 15-100	BODY: ASTM B148 TRIM: ASTM B148, PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 80-400	BODY: ASTM A216-WCB/WCC, A105 DISC: ASTM B148 LINING: EPDM (RUBBER)

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 15-400	PTFE REINF.WITH MINERAL FILLER
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE									
ITEM DESCRIPTION	MESC	15	20	80	100	150	200	250	300	350	400

* PIPE											
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	103.1	149.1						
PIPE (API 5L-B, EW)	74.13.14					211.1	239.1	279.1	319.1	373.1	421.1
PIPE	74.30.05	018.1	028.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1	421.1
* FLANGES											
BLIND FLANGE	76.62.15	008.1	012.1	022.1	024.1	026.1	028.1	030.1	032.1	034.1	036.1
WELDING NECK FLANGE	76.62.78	352.1	354.1	312.1	314.1	316.1	208.1	210.1	212.1	214.1	216.1
* FITTINGS											
CAP BUTT-WELD.END	76.30.19	018.1	024.1	075.1	095.1	115.1	132.1	152.1	172.1	192.1	212.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	625.1	645.1	665.1	682.1	702.1	722.1	742.1	762.1
* VALVES											
BALL VALVE RED.BORE FLANGED FF	77.06.01	003.1	004.1	010.1	012.1						
BUTTERFLY VALVE WAFER TYPE	77.60.03			060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1
* MISCELLANEOUS											
GASKET, RAISED FACE	85.48.74	004.1	006.1	018.1	020.1	024.1	026.1	028.1	030.1	032.1	034.1

		RECB	REEB			RECB	REEB			BNIF	BNIT	
		76.	76.			76.	76.			76.80.37	76.80.31	
RUN*	BR			.					BRANCH	RUN-PIPE		
20*	15	30.72.137.1	30.73.137.1	400*150	29.46.750.1	29.61.750.1			15	80-150	001.1	059.1
100*	80	30.72.275.1	30.73.275.1	400*200	30.72.454.1	30.73.454.1				200-400	002.1	060.1
150*	80	30.72.295.1	30.73.295.1	400*250	30.72.463.1	30.73.463.1			20	80- 80	003.1	061.1
150*100		30.72.305.1	30.73.305.1	400*300	30.72.470.1	30.73.470.1				100-400	004.1	062.1
200*100		30.72.322.1	30.73.322.1	400*350	30.72.482.1	30.73.482.1						
200*150		30.72.333.1	30.73.333.1									
250*100		29.46.340.1	29.61.340.1									
250*150		30.72.353.1	30.73.353.1									
250*200		30.72.361.1	30.73.361.1									
300*150		30.72.386.1	30.73.386.1									
300*200		30.72.392.1	30.73.392.1									
300*250		30.72.402.1	30.73.402.1									
350*150		29.46.600.1	29.61.600.1									
350*200		30.72.423.1	30.73.423.1									
350*250		30.72.430.1	30.73.430.1									
350*300		30.72.442.1	30.73.442.1									

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIT	BRANCH FITTING THREADED OUTLET
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS

BOLTING
BOLTSET BS5155 BFLY VALVE

BOLTSET FLANGED JOINTS

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	

						15	4	1/2	*	60	61.153.1
						20	4	1/2	*	70	61.155.1
80	4	5/8	*	150	61.281.1	80	4	5/8	*	100	61.273.1
100	8	5/8	*	150	61.281.1	100	8	5/8	*	100	61.273.1
150	8	3/4	*	160	61.338.1	150	8	3/4	*	100	61.329.1
200	8	3/4	*	170	61.340.1	200	8	3/4	*	110	61.330.1
250	12	7/8	*	190	61.412.1	250	12	7/8	*	120	61.401.1
300	12	7/8	*	210	61.415.1	300	12	7/8	*	120	61.401.1
350	12	1	*	230	61.483.1	350	12	1	*	130	61.468.1
400	16	1	*	250	61.486.1	400	16	1	*	140	61.469.1

ASSEMBLIES

* DRAIN POINT DN 20 FIG.2H DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED.BORE FLANGED FF 1 77.06.01.004.1
BLIND FLANGE 1 76.62.15.012.1
GASKET, RAISED FACE 2 85.48.74.006.1
STUD BOLT WITH NUTS 8 81.38.61.155.1

* SPRAY-ASSEMBLY TP-1 DN 15 FIG.9A DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COUPLING THREADED ENDS 1 76.06.28.008.1
SPRAY-NOZZLE MALE NPT THREADED 1 NO. M.ES.C .

* SPRAY-ASSEMBLY TP-2 DN 20 FIG.9B DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COUPLING THREADED ENDS 1 76.06.28.012.1
SPRAY-NOZZLE MALE NPT THREADED 1 NO. M.ES.C .

* SPRAY-ASSEMBLY TP-3 DN 15 FIG.9C DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
ELBOW 90DEG. THREADED ENDS 2 76.06.39.008.1
PIPE NIPPLE THRD. ENDS L= 50MM 1 76.06.56.092.1
SPRAY-NOZZLE MALE NPT THREADED 1 NO. M.ES.C .

* SPRAY-ASSEMBLY TP-4 DN 20 FIG.9D DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
ELBOW 90DEG. THREADED ENDS 2 76.06.39.012.1
PIPE NIPPLE THRD. ENDS L= 50MM 1 76.06.56.132.1
SPRAY-NOZZLE MALE NPT THREADED 1 NO. M.ES.C .

CLASS 18120

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
40 100

PRESSURE BAR GA
DN15 -300 10.0 8.0

NOTES

-
- DESIGN LIMITS ACC.TO PIPE AND FITTING COMPONENTS; HOWEVER IF VALVES WILL BE INSTALLED THE P/T RATING OF THE PIPING CLASS SHALL BE CHECKED AGAINST THE VALVE P/T RATING
 - PROPOSALS FOR SPECIAL PARTS TO BE MADE BY PIPING DESIGNER MANUFACTURER SHALL BE CONSULTED FOR FINAL DESIGN
 - PIPE SPOOL AND SPACER:
 - DESIGN AND DIMENSIONS ACC.TO DIN 2873
 - MATERIAL PIPE ACC.TO MESC SPE 74/035
 - MATERIAL SPACER ACC.TO MESC SPE 76/093
 - FLANGE RATING ACC. TO DIN 2501 PN=10 BAR GA
 - THE FOLLOWING REDUCING FLANGES ARE, AT THE -LARGE SIDE-
PROVIDED WITH TAPHOLES: 40 * 25 80 * 50 200 * 150
50 * 25 100 * 50 250 * 150
50 * 40 100 * 80 250 * 200
80 * 40 150 * 100 300 * 250
- USE BOLTSET "LARGE SIDE TAP" FOR THESE FLANGES. USE BOLTSET "LARGE SIDE FL.", FOR ALL OTHER SIZE COMBINATIONS

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
25	.
40	.
50	.
80	.
100	.
150	.
200	.
250	.
300	.

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL GLASS-LINED PN10	PLANT :	
CLASS NO. : 18120	CONSIGNEE :	
RATING : DIN	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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* FLANGES

BLFL	BLIND FLANGE	DN 25-300	DIN17175-HII OR DIN17200 C22.8
LJFS	LAP-JOINT FLANGE SPLIT TYPE	DN 25-300	DIN17100-ST44.3/DIN17200 C22.8

* FITTINGS

E45L	ELBOW 45DEG.	DN 25-300	DIN17200 C22.8, GLASS-LINED
E90L	ELBOW 90DEG.	DN 25-300	DIN17200 C22.8, GLASS-LINED
TEEL	EQUAL TEE	DN 25-300	DIN17200 C22.8, GLASS-LINED

* REDUCING FITTINGS

BRPL	BRANCH PIECE, WAFER TYPE, LINED	DN 80-300	DIN17200 C22.8, GLASS-LINED
RECL	REDUCER CONCENTRIC, LINED.	DN 40-300	DIN17200 C22.8, GLASS-LINED
REEL	REDUCER ECCENTRIC, LINED.	DN 40-300	DIN17200 C22.8, GLASS-LINED
REFL	REDUCING FLANGE, LINED.	DN 40-300	DIN17200 C22.8, GLASS-LINED
TERL	REDUCING TEE, LINED.	DN 40-300	DIN17200 C22.8, GLASS-LINED

* VALVES

BAFF	BALL VALVE FULL BORE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC, A105 BALL: LINED BODY MAT, ALUMINIUM STEM: AISI 316 (L) LINING: PTFE, PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN200-300	BODY: ASTM A216-WCB/WCC, A105 TRIM: AISI 316 (L) LINING: PTFE, PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC, A105 BALL: LINED BODY MAT, ALUMINIUM LINING: PTFE, PFA

* MISCELLANEOUS

GKFF	GASKET, FLAT FACE	DN 25-300	EXPANDED PTFE
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H

PIPING COMPONENTS

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		NOMINAL PIPE SIZE								
ITEM DESCRIPTION	MESC	25	40	50	80	100	150	200	250	300

* FLANGES										
BLIND FLANGE	76.93.96	802.1	804.1	806.1	808.1	810.1	812.1	714.1	716.1	718.1
LAP-JOINT FLANGE SPLIT TYPE	76.93.96	152.1	154.1	156.1	158.1	160.1	162.1	114.1	116.1	118.1
* FITTINGS										
ELBOW 45DEG.	76.93.38	256.1	260.1	262.1	266.1	268.1	272.1	224.1	226.1	228.1
ELBOW 90DEG.	76.93.39	256.1	260.1	262.1	266.1	268.1	272.1	224.1	226.1	228.1
EQUAL TEE	76.93.84	256.1	260.1	262.1	266.1	268.1	272.1	224.1	226.1	228.1
* VALVES										
BALL VALVE FULL BORE FLANGED	77.55.90	505.1	507.1	508.1	510.1	512.1	514.1			
BUTTERFLY VALVE WAFER TYPE	77.60.90							015.1	016.1	017.1
CHECK VALVE FLANGED	77.62.90	005.1	007.1	008.1	010.1	012.1	014.1			
* MISCELLANEOUS										
GASKET, FLAT FACE	85.48.72	108.1	112.1	114.1	118.1	120.1	124.1	226.1	228.1	230.1

	BRPL	RECL	REEL	REFL	TERL
	76.	76.	76.	76.	76.
RUN* BR					
40* 25		93.70.404.1	93.71.404.1	93.95.704.1	93.85.456.1
50* 25		93.70.408.1	93.71.408.1	93.95.708.1	93.85.460.1
50* 40		93.70.412.1	93.71.412.1	93.95.712.1	93.85.462.1
80* 25	93.11.316.1			93.95.722.1	93.85.464.1
80* 40		93.70.426.1	93.71.426.1	93.95.726.1	93.85.466.1
80* 50		93.70.428.1	93.71.428.1	93.95.728.1	93.85.468.1
100* 25	93.11.320.1			93.95.732.1	93.85.470.1
100* 40	93.11.322.1	93.70.434.1	93.71.434.1	93.95.736.1	93.85.472.1
100* 50		93.70.438.1	93.71.438.1	93.95.738.1	93.85.474.1
100* 80		93.70.442.1	93.71.442.1	93.95.742.1	93.85.476.1
150* 25	93.11.326.1				93.85.484.1
150* 40	93.11.328.1				93.85.486.1
150* 50	93.11.330.1			93.95.750.1	93.85.488.1
150* 80		93.70.454.1	93.71.454.1	93.95.754.1	93.85.490.1
150*100		93.70.456.1	93.71.456.1	93.95.756.1	93.85.492.1
200* 25	93.11.236.1				93.85.394.1
200* 40	93.11.238.1				93.85.396.1
200* 50	93.11.240.1			93.95.666.1	93.85.398.1
200* 80		93.70.368.1	93.71.368.1	93.95.668.1	93.85.400.1
200*100		93.70.370.1	93.71.370.1	93.95.670.1	93.85.402.1
200*150		93.70.372.1	93.71.372.1	93.95.672.1	93.85.404.1
250* 25	93.11.256.1				93.85.406.1
250* 40	93.11.258.1				93.85.408.1
250* 50	93.11.260.1				93.85.410.1
250* 80					93.85.412.1
250*100		93.70.382.1	93.71.382.1	93.95.682.1	93.85.414.1
250*150		93.70.384.1	93.71.384.1	93.95.684.1	93.85.416.1
250*200		93.70.386.1	93.71.386.1	93.95.686.1	93.85.418.1
300* 25	93.11.276.1				93.85.420.1
300* 40	93.11.278.1				93.85.422.1
300* 50	93.11.280.1				93.85.424.1
300* 80					93.85.426.1
300*100				93.95.692.1	93.85.428.1
300*150		93.70.392.1	93.71.392.1	93.95.694.1	93.85.430.1
300*200		93.70.394.1	93.71.394.1	93.95.696.1	93.85.432.1
300*250		93.70.396.1	93.71.396.1	93.95.698.1	93.85.434.1

COMP.
NAME DESCRIPTION

BRPL BRANCH PIECE, WAFER TYPE, LINED
RECL REDUCER CONCENTRIC, LINED.
REEL REDUCER ECCENTRIC, LINED.
REFL REDUCING FLANGE, LINED.
TERL REDUCING TEE, LINED.

BOLTSET DIN WAFER TYPE						BOLTSET FLANGED JOINTS						RED.FLANGE LARGE SIDE FL.						RED.FLANGE LARGE SIDE TAP						RED.FLANGE SMALL SIDE					
81.38						81.38						81.38						81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
-----						-----						-----						-----						-----					
						25	4	1/2	*	80	61.157.1							25	4	1/2	*	60	61.153.1						
						40	4	5/8	*	90	61.271.1							40	4	5/8	*	70	61.267.1						
						50	4	5/8	*	100	61.273.1							50	4	5/8	*	80	61.269.1						
80	8	5/8	*	170	61.284.1	80	8	5/8	*	110	61.274.1	80	8	5/8	*	110	61.274.1	80	8	5/8	*	90	61.271.1	80	8	5/8	*	80	61.269.1
100	8	5/8	*	170	61.284.1	100	8	5/8	*	110	61.274.1	100	8	5/8	*	120	61.276.1	100	8	5/8	*	90	61.271.1	100	8	5/8	*	80	61.269.1
150	8	3/4	*	220	61.348.1	150	8	3/4	*	120	61.332.1	150	8	3/4	*	130	61.334.1	150	8	5/8	*	110	61.274.1	150	8	3/4	*	80	61.325.1
200	8	3/4	*	220	61.348.1	200	8	3/4	*	130	61.334.1	200	8	3/4	*	130	61.334.1	200	8	3/4	*	110	61.330.1	200	8	3/4	*	90	61.327.1
250	12	3/4	*	240	61.351.1	250	12	3/4	*	140	61.335.1	250	12	3/4	*	140	61.335.1	250	12	3/4	*	110	61.330.1	250	12	3/4	*	100	61.329.1
300	12	3/4	*	250	61.352.1	300	12	3/4	*	150	61.337.1	300	12	3/4	*	140	61.335.1	300	12	3/4	*	120	61.332.1						

CLASS 18160

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 150

PRESSURE BAR GA
DN25 -200 10.0 10.0

NOTES

- -----
- DESIGN LIMITS ACC.TO VALVE RATING
- THE FOLLOWING REDUCING FLANGES ARE, AT THE -LARGE SIDE-
PROVIDED WITH TAPHOLES 40 * 25 80 * 40 150 * 100
50 * 25 80 * 50 200 * 150
50 * 40 100 * 80
- USE BOLTSET "LARGE SIDE TAP" FOR THESE FLANGES. USE BOLTSET
"LARGE SIDE FL.", FOR ALL OTHER SIZE COMBINATIONS.
- FOR LINED PIPING SEE DEP 30.48.50.12-GEN AND
STD DWG S38.150/151/152/153

TABLE OF SCHEDULES

DN	SCHEDULE
-----	-----
25	40
40	40
50	40
80	40
100	40
150	40
200	20

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL PTFE-LINED	PLANT :	
CLASS NO. : 18160	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 18160, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* FLANGES

BLFL	BLIND FLANGE	DN 25-200	ASTM A105
FLIN	BLIND FLANGE LINER	DN 25-200	ASTM D1457 TYPE 3 CL.1 OR 2

* FITTINGS

CREL	CROSS EQUAL	DN 25-200	ASTM A234-WPB (PTFE/PFA-LINED)
E45L	ELBOW 45DEG.	DN 25-200	ASTM A234-WPB (PTFE/PFA-LINED)
E90L	ELBOW 90DEG.	DN 25-200	ASTM A234-WPB (PTFE/PFA-LINED)
TEEL	EQUAL TEE	DN 25-200	ASTM A234-WPB (PTFE/PFA-LINED)

* REDUCING FITTINGS

BRPL	BRANCH PIECE, WAFER TYPE, LINED	DN 40-200	ASTM A106-B (PTFE-LINED)
RECL	REDUCER CONCENTRIC, LINED.	DN 40-200	ASTM A234-WPB (PTFE/PFA-LINED)
REEL	REDUCER ECCENTRIC, LINED.	DN 40-200	ASTM A234-WPB (PTFE/PFA-LINED)
REFL	REDUCING FLANGE, LINED.	DN 40-200	ASTM A105 (PTFE/PFA-LINED)
TERL	REDUCING TEE, LINED.	DN 40-200	ASTM A234-WPB (PTFE/PFA-LINED)

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 25-200	BODY: ASTM A216-WCB/WCC, A105 BALL: ALUMINIUM STEM: ASTM B574 LINING: PTFE, PFA
BUVW	BUTTERFLY VALVE WAFER TYPE	DN 50-200	BODY: ASTM A216-WCB/WCC, A105 TRIM: AISI 316 (L) LINING: PTFE, PFA
CHVF	CHECK VALVE FLANGED	DN 25-150	BODY: ASTM A216-WCB/WCC, A105 BALL: LINED BODY MAT, ALUMINIUM LINING: PTFE, PFA

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 25-200	PTFE REINF. WITH MINERAL FILLER
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 18160, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE							
		25	40	50	80	100	150	200	

* FLANGES									
BLIND FLANGE	76.62.11	066.1	068.1	070.1	072.1	074.1	076.1	078.1	
BLIND FLANGE LINER	76.80.81	863.1	865.1	866.1	867.1	868.1	870.1	871.1	
* FITTINGS									
CROSS EQUAL	76.93.30	156.1	160.1	162.1	166.1	168.1	172.1	174.1	
ELBOW 45DEG.	76.93.38	156.1	160.1	162.1	166.1	168.1	172.1	174.1	
ELBOW 90DEG.	76.93.39	156.1	160.1	162.1	166.1	168.1	172.1	174.1	
EQUAL TEE	76.93.84	156.1	160.1	162.1	166.1	168.1	172.1	174.1	
* VALVES									
BALL VALVE RED. BORE FLANGED	77.55.00	005.1	007.1	008.1	010.1	012.1	014.1	015.1	
BUTTERFLY VALVE WAFER TYPE	77.60.20			008.1	010.1	012.1	014.1	015.1	
CHECK VALVE FLANGED	77.62.00	005.1	007.1	008.1	010.1	012.1	014.1	015.1	
* MISCELLANEOUS									
GASKET, RAISED FACE	85.48.74	008.1	012.1	014.1	018.1	020.1	024.1	026.1	

	BRPL	RECL	REEL	REFL	TERL
	76.	76.	76.	76.	76.
RUN* BR					
40* 25	93.11.160.1	93.70.204.1	93.71.204.1	93.95.206.1	93.85.206.1
50* 25	93.11.162.1	93.70.208.1	93.71.208.1	93.95.210.1	93.85.210.1
50* 40	93.11.164.1	93.70.212.1	93.71.212.1	93.95.212.1	93.85.212.1
80* 25	93.11.166.1			93.95.214.1	93.85.214.1
80* 40	93.11.168.1	93.70.226.1	93.71.226.1	93.95.216.1	93.85.216.1
80* 50		93.70.228.1	93.71.228.1	93.95.218.1	93.85.218.1
100* 25	93.11.170.1			93.95.220.1	93.85.220.1
100* 40	93.11.172.1			93.95.222.1	93.85.222.1
100* 50		93.70.238.1	93.71.238.1	93.95.224.1	93.85.224.1
100* 80		93.70.242.1	93.71.242.1	93.95.226.1	93.85.226.1
150* 25	93.11.176.1			93.95.234.1	93.85.234.1
150* 40	93.11.178.1			93.95.236.1	93.85.236.1
150* 50				93.95.238.1	93.85.238.1
150* 80		93.70.254.1	93.71.254.1	93.95.240.1	93.85.240.1
150*100		93.70.256.1	93.71.256.1	93.95.242.1	93.85.242.1
200* 25	93.11.186.1			93.95.244.1	93.85.244.1
200* 40	93.11.188.1			93.95.246.1	93.85.246.1
200* 50				93.95.248.1	93.85.248.1
200* 80				93.95.250.1	93.85.250.1
200*100		93.70.270.1	93.71.270.1	93.95.252.1	93.85.252.1
200*150		93.70.272.1	93.71.272.1	93.95.254.1	93.85.254.1

COMP.	
NAME	DESCRIPTION
BRPL	BRANCH PIECE, WAFER TYPE, LINED
RECL	REDUCER CONCENTRIC, LINED.
REEL	REDUCER ECCENTRIC, LINED.
REFL	REDUCING FLANGE, LINED.
TERL	REDUCING TEE, LINED.

BOLTING

DEP 31.38.01.12-GEN.CLASS
ISSUE DATE : JANUARY 1999

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BOLTS RED.FLG. S.SIDE -P						BOLTS.RED.FLG. L.S.FLG.-P						BOLTS.RED.FLG. L.S.TAP -P						BOLTSET BRANCH PIECES -P						BOLTSET FLANGED JOINT -P					
81.38						81.38						81.38						81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
25	4	1/2	*	70	61.155.1													25	4	1/2	*	150	61.169.1	25	4	1/2	*	80	61.157.1
40	4	1/2	*	80	61.157.1	40	4	1/2	*	100	61.161.1	40	4	1/2	*	90	61.159.1	40	4	1/2	*	160	61.171.1	40	4	1/2	*	90	61.159.1
50	4	5/8	*	90	61.271.1	50	4	5/8	*	110	61.274.1	50	4	5/8	*	100	61.273.1	50	4	5/8	*	170	61.284.1	50	4	5/8	*	100	61.273.1
80	4	5/8	*	100	61.273.1	80	4	5/8	*	120	61.276.1	80	4	5/8	*	110	61.274.1	80	4	5/8	*	190	61.287.1	80	4	5/8	*	110	61.274.1
100	8	5/8	*	100	61.273.1	100	8	5/8	*	130	61.278.1	100	8	5/8	*	120	61.276.1	100	8	5/8	*	190	61.287.1	100	8	5/8	*	110	61.274.1
150	8	3/4	*	110	61.330.1	150	8	3/4	*	140	61.335.1	150	8	3/4	*	120	61.332.1	150	8	3/4	*	210	61.346.1	150	8	3/4	*	130	61.334.1
						200	8	3/4	*	150	61.337.1	200	8	3/4	*	130	61.334.1	200	8	3/4	*	220	61.348.1	200	8	3/4	*	140	61.335.1

PIPING CLASSES ASME RATING 300

CLASS 31011

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	50.5	50.0	46.3	45.1	43.8	41.8	38.8	36.8	32.6

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL
(AMBIENT TO FLUID) 265 DEG. C.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- USE SPIRAL WOUND GASKETS (CLASS 31300), IF GRAPHITE TANGED
INSERT GASKETS ARE NOT ALLOWED DUE TO PRODUCT CONTAMINATION

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	40
300	C	C	C	C	E	E	E	E	E	E	E	A					80	40
250	C	C	C	C	E	E	E	E	E	E	A						100	40
200	C	C	C	C	E	E	E	E	E	A							150	40
150	C	C	C	C	E	E	E	A									200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	30
40	C	B	B	A													400	30
25	B	B	A														450	30
20	B	A															500	30
15	A																600	30

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 31011	CONSIGNEE	:	
ANS RATING : CLASS 300	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B
PNPT	PIPE NIPPLE PLAIN/THREADED	---	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
CAPT	CAP THREADED	---	ASTM A105
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVS	GATE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE	76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE	76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	236.1	257.1	278.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	053.1	054.1	055.1	057.1												
	77.10.20					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE SOCKET WELD	77.11.04	003.1	004.1	005.1	007.1												
GATE VALVE FLANGED	77.20.04	053.1	054.1	055.1	057.1												
	77.20.20					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE SOCKET WELD	77.21.04	003.1	004.1	005.1	007.1												
GLOBE VALVE FLANGED	77.30.05	053.1	054.1	055.1	057.1												
	77.30.20					058.1	060.1	062.1	064.1	065.1							
GLOBE VALVE SOCKET WELD	77.31.04	003.1	004.1	005.1	007.1												
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN	76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
STRAINER Y-TYPE	76.83.19					452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.370.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.382.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.394.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.404.1	29.46.752.1	29.61.752.1	
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.464.1	30.72.452.1	30.73.452.1	30.89.478.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.480.1	30.72.461.1	30.73.461.1	30.89.504.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.494.1	30.72.473.1	30.73.473.1	30.89.530.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.506.1	30.72.484.1	30.73.484.1	30.89.555.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.371.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.383.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.395.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.405.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.466.1	30.72.502.1	30.73.502.1	30.89.579.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.482.1	30.72.521.1	30.73.521.1	30.89.603.1
150* 50	79.00.814.1				450*300	79.00.496.1	30.72.551.1	30.73.551.1	30.89.627.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.508.1	30.72.582.1	30.73.582.1	30.89.651.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.518.1	30.72.612.1	30.73.612.1	30.89.675.1
200* 50	79.00.366.1				500* 50	79.00.372.1			
200* 80	79.00.378.1				500* 80	79.00.384.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.396.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.406.1			
250* 50	79.00.367.1				500*200	79.00.468.1	29.46.901.1	29.61.901.1	30.89.699.1
250* 80	79.00.379.1				500*250	79.00.484.1	30.72.634.1	30.73.634.1	30.89.723.1
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.498.1	30.72.641.1	30.73.641.1	30.89.747.1
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.510.1	30.72.672.1	30.73.672.1	30.89.771.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.520.1	30.72.702.1	30.73.702.1	30.89.795.1
300* 50	79.00.368.1				500*450	79.00.528.1	30.72.732.1	30.73.732.1	30.89.819.1
300* 80	79.00.380.1				600* 50	79.00.374.1			
300*100	79.00.392.1				600* 80	79.00.386.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.398.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.408.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.472.1			
350* 50	79.00.369.1				600*250	79.00.488.1	30.72.802.1	30.73.802.1	30.89.843.1
350* 80	79.00.381.1				600*300	79.00.502.1	30.72.822.1	30.73.822.1	30.89.867.1
350*100	79.00.393.1				600*350	79.00.514.1	30.72.842.1	30.73.842.1	30.89.891.1
350*150	79.00.403.1	30.72.412.1	30.73.412.1	30.89.378.1	600*400	79.00.524.1	30.72.882.1	30.73.882.1	30.89.915.1
350*200	79.00.462.1	30.72.421.1	30.73.421.1	30.89.389.1	600*450	79.00.532.1	30.72.912.1	30.73.912.1	30.89.939.1
350*250	79.00.478.1	30.72.433.1	30.73.433.1	30.89.414.1	600*500	79.00.538.1	30.72.942.1	30.73.942.1	30.89.963.1
350*300	79.00.492.1	30.72.443.1	30.73.443.1	30.89.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	101.1	001.1
	200-600	102.1	002.1
20	40- 80	103.1	003.1
	100-600	104.1	004.1
25	40- 40	105.1	005.1
	50- 50	106.1	006.1
	80-100	107.1	007.1
	150-600	108.1	008.1
40	50- 50	110.1	009.1
	80- 80	111.1	010.1
	100-100	112.1	011.1
	150-300	113.1	013.1
	350-600	114.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.062.1	450	76.81.65.562.1
840	76.81.65.064.1	840	76.81.65.564.1
1230	76.81.65.066.1	1230	76.81.65.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.062.1	230	76.83.37.101.1
813	76.80.60.064.1	255	76.83.37.102.1
1219	76.80.60.066.1	305	76.83.37.103.1
1524	76.80.60.068.1	355	76.83.37.105.1
1829	76.80.60.070.1	405	76.83.37.106.1
2134	76.80.60.072.1	455	76.83.37.107.1
2438	76.80.60.074.1		
2743	76.80.60.076.1		
3048	76.80.60.078.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0B DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.108.1
GATE VALVE SOCKET WELD 1 77.21.04.003.1
PIPE NIPPLE 50MM 1 76.30.57.431.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.131.1

* DRAIN POINT DN 20 FIG.0B DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.112.1
GATE VALVE SOCKET WELD 1 77.21.04.004.1
PIPE NIPPLE 50MM 1 76.30.57.441.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.141.1

* DRAIN POINT DN 20 FIG.0A DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.112.1
GATE VALVE SOCKET WELD 1 77.21.04.004.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.141.1

* ORIFICE INSTR.CONN. DN 15 FIG.0D DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE SOCKET WELD 2 77.21.04.003.1
LAP-JOINT FLANGE 2 76.62.20.308.1
PIPE NIPPLE 50MM 2 76.30.57.431.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.62.78.602.1

* PRESSURE INSTR.CONN. DN 15 FIG.0E DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.104.1
GATE VALVE SOCKET WELD 1 77.21.04.003.1
LAP-JOINT FLANGE 1 76.62.20.308.1
PIPE NIPPLE 50MM 2 76.30.57.431.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* PRESSURE INSTR.CONN. DN 15 FIG.0D DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.104.1
GATE VALVE SOCKET WELD 1 77.21.04.003.1
LAP-JOINT FLANGE 1 76.62.20.308.1
PIPE NIPPLE 50MM 1 76.30.57.431.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.04.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1B DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.108.1
GLOBE VALVE SOCKET WELD 1 77.31.04.003.1
PIPE NIPPLE 50MM 1 76.30.57.431.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.131.1

* VENT POINT DN 20 FIG.1B DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.112.1
GLOBE VALVE SOCKET WELD 1 77.31.04.004.1
PIPE NIPPLE 50MM 1 76.30.57.441.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.141.1

* VENT POINT DN 20 FIG.1A DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.112.1
GLOBE VALVE SOCKET WELD 1 77.31.04.004.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.141.1

CLASS 31012

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	42.9	42.9	42.9	42.9	42.9	40.9	38.0	36.2	27.7

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - USE SPIRAL WOUND GASKETS (CLASS 31300), IF GRAPHITE TANGED INSERT GASKETS ARE NOT ALLOWED DUE TO PRODUCT CONTAMINATION
 - API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	40
300	C	C	C	C	E	E	E	E	E	E	E	A					80	40
250	C	C	C	C	E	E	E	E	E	E	A						100	40
200	C	C	C	C	E	E	E	E	E	A							150	40
150	C	C	C	C	E	E	E	A									200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	C	B	A											350	30
40	C	B	B	A													400	30
25	B	B	A														450	30
20	B	A															500	30
15	A																600	30

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 31012	CONSIGNEE	:	
ANS RATING : CLASS 300	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B
PNPT	PIPE NIPPLE PLAIN/THREADED	---	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
CAPT	CAP THREADED	---	ASTM A105
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVS	GATE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE (API 5L-B, SML)		74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)		74.13.14								211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	
PIPE (API 5L-B, SAW)		74.13.17																579.1
PIPE		74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	236.1	257.1	278.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	053.1	054.1	055.1	057.1												
		77.10.20					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE SOCKET WELD		77.11.04	003.1	004.1	005.1	007.1												
GATE VALVE FLANGED		77.20.04	053.1	054.1	055.1	057.1												
		77.20.20					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE SOCKET WELD		77.21.04	003.1	004.1	005.1	007.1												
GLOBE VALVE FLANGED		77.30.05	053.1	054.1	055.1	057.1												
		77.30.20					058.1	060.1	062.1	064.1	065.1							
GLOBE VALVE SOCKET WELD		77.31.04	003.1	004.1	005.1	007.1												
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
STRAINER Y-TYPE		76.83.19					452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.370.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.382.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.394.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.404.1	29.46.752.1	29.61.752.1	
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.464.1	30.72.452.1	30.73.452.1	30.89.478.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.480.1	30.72.461.1	30.73.461.1	30.89.504.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.494.1	30.72.473.1	30.73.473.1	30.89.530.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.506.1	30.72.484.1	30.73.484.1	30.89.555.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.371.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.383.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.395.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.405.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.466.1	30.72.502.1	30.73.502.1	30.89.579.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.482.1	30.72.521.1	30.73.521.1	30.89.603.1
150* 50	79.00.814.1				450*300	79.00.496.1	30.72.551.1	30.73.551.1	30.89.627.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.508.1	30.72.582.1	30.73.582.1	30.89.651.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.518.1	30.72.612.1	30.73.612.1	30.89.675.1
200* 50	79.00.366.1				500* 50	79.00.372.1			
200* 80	79.00.378.1				500* 80	79.00.384.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.396.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.406.1			
250* 50	79.00.367.1				500*200	79.00.468.1	29.46.901.1	29.61.901.1	30.89.699.1
250* 80	79.00.379.1				500*250	79.00.484.1	30.72.634.1	30.73.634.1	30.89.723.1
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.498.1	30.72.641.1	30.73.641.1	30.89.747.1
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.510.1	30.72.672.1	30.73.672.1	30.89.771.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.520.1	30.72.702.1	30.73.702.1	30.89.795.1
300* 50	79.00.368.1				500*450	79.00.528.1	30.72.732.1	30.73.732.1	30.89.819.1
300* 80	79.00.380.1				600* 50	79.00.374.1			
300*100	79.00.392.1				600* 80	79.00.386.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.398.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.408.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.472.1			
350* 50	79.00.369.1				600*250	79.00.488.1	30.72.802.1	30.73.802.1	30.89.843.1
350* 80	79.00.381.1				600*300	79.00.502.1	30.72.822.1	30.73.822.1	30.89.867.1
350*100	79.00.393.1				600*350	79.00.514.1	30.72.842.1	30.73.842.1	30.89.891.1
350*150	79.00.403.1	30.72.412.1	30.73.412.1	30.89.378.1	600*400	79.00.524.1	30.72.882.1	30.73.882.1	30.89.915.1
350*200	79.00.462.1	30.72.421.1	30.73.421.1	30.89.389.1	600*450	79.00.532.1	30.72.912.1	30.73.912.1	30.89.939.1
350*250	79.00.478.1	30.72.433.1	30.73.433.1	30.89.414.1	600*500	79.00.538.1	30.72.942.1	30.73.942.1	30.89.963.1
350*300	79.00.492.1	30.72.443.1	30.73.443.1	30.89.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	101.1	001.1
	200-600	102.1	002.1
20	40- 80	103.1	003.1
	100-600	104.1	004.1
25	40- 40	105.1	005.1
	50- 50	106.1	006.1
	80-100	107.1	007.1
	150-600	108.1	008.1
40	50- 50	110.1	009.1
	80- 80	111.1	010.1
	100-100	112.1	011.1
	150-300	113.1	013.1
	350-600	114.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.062.1	450	76.81.65.562.1
840	76.81.65.064.1	840	76.81.65.564.1
1230	76.81.65.066.1	1230	76.81.65.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.062.1	230	76.83.37.101.1
813	76.80.60.064.1	255	76.83.37.102.1
1219	76.80.60.066.1	305	76.83.37.103.1
1524	76.80.60.068.1	355	76.83.37.105.1
1829	76.80.60.070.1	405	76.83.37.106.1
2134	76.80.60.072.1	455	76.83.37.107.1
2438	76.80.60.074.1		
2743	76.80.60.076.1		
3048	76.80.60.078.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0B DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.108.1
GATE VALVE SOCKET WELD 1 77.21.04.003.1
PIPE NIPPLE 50MM 1 76.30.57.431.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.131.1

* DRAIN POINT DN 20 FIG.0B DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.112.1
GATE VALVE SOCKET WELD 1 77.21.04.004.1
PIPE NIPPLE 50MM 1 76.30.57.441.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.141.1

* DRAIN POINT DN 20 FIG.0A DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.112.1
GATE VALVE SOCKET WELD 1 77.21.04.004.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.141.1

* ORIFICE INSTR.CONN. DN 15 FIG.0D DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE SOCKET WELD 2 77.21.04.003.1
LAP-JOINT FLANGE 2 76.62.20.308.1
PIPE NIPPLE 50MM 2 76.30.57.431.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.62.78.602.1

* PRESSURE INSTR.CONN. DN 15 FIG.0E DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.104.1
GATE VALVE SOCKET WELD 1 77.21.04.003.1
LAP-JOINT FLANGE 1 76.62.20.308.1
PIPE NIPPLE 50MM 2 76.30.57.431.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* PRESSURE INSTR.CONN. DN 15 FIG.0D DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.104.1
GATE VALVE SOCKET WELD 1 77.21.04.003.1
LAP-JOINT FLANGE 1 76.62.20.308.1
PIPE NIPPLE 50MM 1 76.30.57.431.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.04.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1B DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.108.1
GLOBE VALVE SOCKET WELD 1 77.31.04.003.1
PIPE NIPPLE 50MM 1 76.30.57.431.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.131.1

* VENT POINT DN 20 FIG.1B DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.112.1
GLOBE VALVE SOCKET WELD 1 77.31.04.004.1
PIPE NIPPLE 50MM 1 76.30.57.441.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.141.1

* VENT POINT DN 20 FIG.1A DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
CAP THREADED 1 76.05.18.112.1
GLOBE VALVE SOCKET WELD 1 77.31.04.004.1
PIPE NIPPLE PLAIN/THREADED 1 76.05.57.141.1

CLASS 31013

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	50.5	50.0	46.3	45.1	43.8	41.8	38.8	36.8	32.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	40
300	C	C	C	C	E	E	E	E	E	E	E	A					80	40
250	C	C	C	C	E	E	E	E	E	E	A						100	40
200	C	C	C	C	E	E	E	E	E	A							150	40
150	C	C	C	C	E	E	E	A									200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	30
40	C	B	B	A													400	30
25	B	B	A														450	30
20	B	A															500	30
15	A																600	30

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT	PLANT	:	
CLASS NO. : 31013		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY :		
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO. :		
REV. DATE : 12/96		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31013, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE	76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE	76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	236.1	257.1	278.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
* VALVES																	
CHECK VALVE FLANGED	77.10.12	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED	77.20.36	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED	77.30.12	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN	76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET	76.62.96					140.1	142.1	044.1	046.1	020.1	022.1	024.1	026.1	028.1	030.1	032.1	034.1
STRAINER Y-TYPE	76.83.19					352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1	368.1			

BROB				RECB				REEB				TERB				BROB				RECB				REEB				TERB				BNIF				BNIP																			
76.				76.				76.				76.				76.				76.				76.				76.				76.80.37				76.80.31																			
RUN* BR																												BRANCH				RUN-PIPE																							
20* 15				30.72.137.1				30.73.137.1				30.89.035.1				400* 50				79.00.370.1																15				40-150				101.1				001.1							
25* 15				30.72.147.1				30.73.147.1				30.89.045.1				400* 80				79.00.382.1																200-600				102.1				002.1											
25* 20				30.72.157.1				30.73.157.1				30.89.055.1				400*100				79.00.394.1																20				40- 80				103.1				003.1							
40* 15				30.72.167.1				30.73.167.1				30.89.065.1				400*150				79.00.404.1				29.46.752.1				29.61.752.1												100-600				104.1				004.1							
40* 20				30.72.177.1				30.73.177.1				30.89.075.1				400*200				79.00.464.1				30.72.452.1				30.73.452.1				30.89.478.1								25				40- 40				105.1				005.1			
40* 25				30.72.187.1				30.73.187.1				30.89.085.1				400*250				79.00.480.1				30.72.461.1				30.73.461.1				30.89.504.1								50- 50				106.1				006.1							
50* 20				29.46.192.1				29.61.192.1				30.89.100.1				400*300				79.00.494.1				30.72.473.1				30.73.473.1				30.89.530.1								80-100				107.1				007.1							
50* 25				30.72.196.1				30.73.196.1				30.89.109.1				400*350				79.00.506.1				30.72.484.1				30.73.484.1				30.89.555.1								150-600				108.1				008.1							
50* 40				30.72.206.1				30.73.206.1				30.89.118.1				450* 50				79.00.371.1																40				50- 50				110.1				009.1							
80* 40				30.72.226.1				30.73.226.1				30.89.127.1				450* 80				79.00.383.1																80- 80				111.1				010.1											
80* 50				79.00.810.1				30.72.235.1				30.73.235.1				30.89.132.1				450*100				79.00.395.1																100-100				112.1				011.1							
100* 40								30.72.250.1				30.73.250.1				30.89.145.1				450*150				79.00.405.1																150-300				113.1				013.1							
100* 50				79.00.812.1				30.72.265.1				30.73.265.1				30.89.153.1				450*200				79.00.466.1				30.72.502.1				30.73.502.1				30.89.579.1								350-600				114.1				014.1			
100* 80				79.00.836.1				30.72.275.1				30.73.275.1				30.89.165.1				450*250				79.00.482.1				30.72.521.1				30.73.521.1				30.89.603.1																			
150* 50				79.00.814.1												450*300				79.00.496.1				30.72.551.1				30.73.551.1				30.89.627.1																							
150* 80				79.00.838.1				30.72.295.1				30.73.295.1				30.89.177.1				450*350				79.00.508.1				30.72.582.1				30.73.582.1				30.89.651.1																			
150*100				79.00.860.1				30.72.305.1				30.73.305.1				30.89.189.1				450*400				79.00.518.1				30.72.612.1				30.73.612.1				30.89.675.1																			
200* 50				79.00.366.1												500* 50				79.00.372.1																																			
200* 80				79.00.378.1												500* 80				79.00.384.1																																			
200*100				79.00.390.1				30.72.324.1				30.73.324.1				30.89.211.1				500*100				79.00.396.1																															
200*150				79.00.400.1				30.72.334.1				30.73.334.1				30.89.231.1				500*150				79.00.406.1																															
250* 50				79.00.367.1												500*200				79.00.468.1				29.46.901.1				29.61.901.1				30.89.699.1								LEVEL				DISPLACER				CHAMBER				THERMOW			
250* 80				79.00.379.1												500*250				79.00.484.1				30.72.634.1				30.73.634.1				30.89.723.1								LENGTH				MESCNUMBER				LENGTH							
250*100				79.00.391.1				29.46.342.1				29.61.342.1				30.89.259.1				500*300				79.00.498.1				30.72.641.1				30.73.641.1				30.89.747.1								-----				-----				-----			
250*150				79.00.401.1				30.72.352.1				30.73.352.1				30.89.277.1				500*350				79.00.510.1				30.72.672.1				30.73.672.1				30.89.771.1				356				76.80.59.062.1				230							
250*200				79.00.458.1				30.72.363.1				30.73.363.1				30.89.290.1				500*400				79.00.520.1				30.72.702.1				30.73.702.1				30.89.795.1				813				76.80.59.064.1				255							
300* 50				79.00.368.1												500*450				79.00.528.1				30.72.732.1				30.73.732.1				30.89.819.1								1219				76.80.59.066.1				305							
300* 80				79.00.380.1												600* 50				79.00.374.1																				1524				76.80.59.068.1				355							
300*100				79.00.392.1												600* 80				79.00.386.1																				1829				76.80.59.070.1				405							
300*150				79.00.402.1				30.72.381.1				30.73.381.1				30.89.316.1				600*100				79.00.398.1																2134				76.80.59.072.1				455							
300*200				79.00.460.1				30.72.394.1				30.73.394.1				30.89.327.1				600*150				79.00.408.1																2438				76.80.59.074.1											
300*250				79.00.476.1				30.72.403.1				30.73.403.1				30.89.349.1				600*200				79.00.472.1																2743				76.80.59.076.1											
350* 50				79.00.369.1												600*250				79.00.488.1				30.72.802.1				30.73.802.1				30.89.843.1				3048				76.80.59.078.1															
350* 80				79.00.381.1												600*300				79.00.502.1				30.72.822.1				30.73.822.1				30.89.867.1																							
350*100				79.00.393.1												600*350				79.00.514.1				30.72.842.1				30.73.842.1				30.89.891.1																							
350*150				79.00.403.1				30.72.412.1				30.73.412.1				30.89.378.1				600*400				79.00.524.1				30.72.882.1				30.73.882.1				30.89.915.1																			
350*200				79.00.462.1				30.72.421.1				30.73.421.1				30.89.389.1				600*450				79.00.532.1				30.72.912.1				30.73.912.1				30.89.939.1																			
350*250				79.00.478.1				30.72.433.1				30.73.433.1				30.89.414.1				600*500				79.00.538.1				30.72.942.1				30.73.942.1				30.89.963.1																			
350*300				79.00.492.1				30.72.443.1				30.73.443.1				30.89.440.1																																							

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

LEVEL	DISPLACER	CHAMBER	THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.59.062.1		230	76.83.37.101.1
813	76.80.59.064.1		255	76.83.37.102.1
1219	76.80.59.066.1		305	76.83.37.103.1
1524	76.80.59.068.1		355	76.83.37.105.1
1829	76.80.59.070.1		405	76.83.37.106.1
2134	76.80.59.072.1		455	76.83.37.107.1
2438	76.80.59.074.1			
2743	76.80.59.076.1			
3048	76.80.59.078.1			

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.36.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.36.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.604.1

* DRAIN POINT DN 20 FIG.0H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.36.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.36.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.62.78.602.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.36.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.36.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.36.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.30.12.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.12.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.604.1

* VENT POINT DN 20 FIG.1H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.12.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 31015

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	50.5	50.0	46.3	45.1	43.8	41.8	38.8	36.8	32.6

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	40
300	C	C	C	C	E	E	E	E	E	E	E	E					80	40
250	C	C	C	C	E	E	E	E	E	E	A						100	40
200	C	C	C	C	E	E	E	E	E	A							150	40
150	C	C	C	C	E	E	E	E	A								200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	30
40	C	B	B	A													400	30
25	B	B	A														450	30
20	B	A															500	30
15	A																600	30

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 31015		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY	:	
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO.	:	
REV. DATE : 12/96		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31015, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
PIPE NIPPLE 50MM		76.30.54	031.1	041.1	051.1	071.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.37	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.11.14	053.1	054.1	055.1	057.1												
CHECK VALVE FLANGED		77.10.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE BUTT-WELD ENDS		77.21.14	053.1	054.1	055.1	057.1												
GATE VALVE FLANGED		77.20.04	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED		77.30.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
STRAINER Y-TYPE		76.83.22					052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.66.137.1	30.67.137.1	30.88.035.1	400* 50	79.00.370.1			
25* 15		30.66.147.1	30.67.147.1	30.88.045.1	400* 80	79.00.382.1			
25* 20		30.66.157.1	30.67.157.1	30.88.055.1	400*100	79.00.394.1			
40* 15		30.66.167.1	30.67.167.1	30.88.065.1	400*150	79.00.404.1	29.47.752.1	29.62.752.1	30.88.468.1
40* 20		30.66.177.1	30.67.177.1	30.88.075.1	400*200	79.00.464.1	30.66.452.1	30.67.452.1	30.88.478.1
40* 25		30.66.187.1	30.67.187.1	30.88.085.1	400*250	79.00.480.1	30.66.461.1	30.67.461.1	30.88.504.1
50* 20		30.66.192.1	30.67.192.1	30.88.100.1	400*300	79.00.494.1	30.66.473.1	30.67.473.1	30.88.530.1
50* 25		30.66.196.1	30.67.196.1	30.88.109.1	400*350	79.00.506.1	30.66.484.1	30.67.484.1	30.88.555.1
50* 40		30.66.206.1	30.67.206.1	30.88.118.1	450* 50	79.00.371.1			
80* 40		30.66.226.1	30.67.226.1	30.88.127.1	450* 80	79.00.383.1			
80* 50	79.00.810.1	30.66.235.1	30.67.235.1	30.88.132.1	450*100	79.00.395.1			
100* 40		30.66.250.1	30.67.250.1	30.88.145.1	450*150	79.00.405.1			
100* 50	79.00.812.1	30.66.265.1	30.67.265.1	30.88.153.1	450*200	79.00.466.1	30.66.502.1	30.67.502.1	30.88.579.1
100* 80	79.00.836.1	30.66.275.1	30.67.275.1	30.88.165.1	450*250	79.00.482.1	30.66.521.1	30.67.521.1	30.88.603.1
150* 50	79.00.814.1				450*300	79.00.496.1	30.66.551.1	30.67.551.1	30.88.627.1
150* 80	79.00.838.1	30.66.295.1	30.67.295.1	30.88.177.1	450*350	79.00.508.1	30.66.582.1	30.67.582.1	30.88.651.1
150*100	79.00.860.1	30.66.305.1	30.67.305.1	30.88.189.1	450*400	79.00.518.1	30.66.612.1	30.67.612.1	30.88.675.1
200* 50	79.00.366.1				500* 50	79.00.372.1			
200* 80	79.00.378.1				500* 80	79.00.384.1			
200*100	79.00.390.1	30.66.324.1	30.67.324.1	30.88.211.1	500*100	79.00.396.1			
200*150	79.00.400.1	30.66.334.1	30.67.334.1	30.88.231.1	500*150	79.00.406.1			
250* 50	79.00.367.1				500*200	79.00.468.1	29.47.901.1	29.62.901.1	30.88.699.1
250* 80	79.00.379.1				500*250	79.00.484.1	30.66.634.1	30.67.634.1	30.88.723.1
250*100	79.00.391.1	29.47.342.1	29.62.342.1	30.88.259.1	500*300	79.00.498.1	30.66.641.1	30.67.641.1	30.88.747.1
250*150	79.00.401.1	30.66.352.1	30.67.352.1	30.88.277.1	500*350	79.00.510.1	30.66.672.1	30.67.672.1	30.88.771.1
250*200	79.00.458.1	30.66.363.1	30.67.363.1	30.88.290.1	500*400	79.00.520.1	30.66.702.1	30.67.702.1	30.88.795.1
300* 50	79.00.368.1				500*450	79.00.528.1	30.66.732.1	30.67.732.1	30.88.819.1
300* 80	79.00.380.1				600* 50	79.00.374.1			
300*100	79.00.392.1				600* 80	79.00.386.1			
300*150	79.00.402.1	30.66.381.1	30.67.381.1	30.88.316.1	600*100	79.00.398.1			
300*200	79.00.460.1	30.66.394.1	30.67.394.1	30.88.327.1	600*150	79.00.408.1			
300*250	79.00.476.1	30.66.403.1	30.67.403.1	30.88.349.1	600*200	79.00.472.1			
350* 50	79.00.369.1				600*250	79.00.488.1	30.66.802.1	30.67.802.1	30.88.843.1
350* 80	79.00.381.1				600*300	79.00.502.1	30.66.822.1	30.67.822.1	30.88.867.1
350*100	79.00.393.1				600*350	79.00.514.1	30.66.842.1	30.67.842.1	30.88.891.1
350*150	79.00.403.1	30.66.412.1	30.67.412.1	30.88.378.1	600*400	79.00.524.1	30.66.882.1	30.67.882.1	30.88.915.1
350*200	79.00.462.1	30.66.421.1	30.67.421.1	30.88.389.1	600*450	79.00.532.1	30.66.912.1	30.67.912.1	30.88.939.1
350*250	79.00.478.1	30.66.433.1	30.67.433.1	30.88.414.1	600*500	79.00.538.1	30.66.942.1	30.67.942.1	30.88.963.1
350*300	79.00.492.1	30.66.443.1	30.67.443.1	30.88.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	101.1	001.1
	200-600	102.1	002.1
20	40- 80	103.1	003.1
	100-600	104.1	004.1
25	40- 40	105.1	005.1
	50- 50	106.1	006.1
	80-100	107.1	007.1
	150-600	108.1	008.1
40	50- 50	110.1	009.1
	80- 80	111.1	010.1
	100-100	112.1	011.1
	150-300	113.1	013.1
	350-600	114.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.422.1		230	76.83.37.101.1
813	76.80.60.424.1		255	76.83.37.102.1
1219	76.80.60.426.1		305	76.83.37.103.1
1524	76.80.60.428.1		355	76.83.37.105.1
1829	76.80.60.430.1		405	76.83.37.106.1
2134	76.80.60.432.1		455	76.83.37.107.1
2438	76.80.60.434.1			
2743	76.80.60.436.1			
3048	76.80.60.438.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 70	15	4	1/2	* 70
20	4	5/8	* 80	20	4	5/8	* 80
25	4	5/8	* 80	25	4	5/8	* 90
40	4	3/4	* 90	40	4	3/4	* 100
50	8	5/8	* 90				
80	8	3/4	* 110				
100	8	3/4	* 120				
150	12	3/4	* 130				
200	12	7/8	* 140				
250	16	1	* 160				
300	16	1 1/8	* 170				
350	20	1 1/8	* 180				
400	20	1 1/4	* 190				
450	24	1 1/4	* 200				
500	24	1 1/4	* 210				
600	24	1 1/2	* 240				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 80
				20	4	5/8	* 90
				25	4	5/8	* 90
				40	4	3/4	* 100
50	8	5/8	* 150	50	8	5/8	* 100
80	8	3/4	* 150	80	8	3/4	* 120
100	12	3/4	* 140	100	8	3/4	* 130
150	12	3/4	* 140	150	12	3/4	* 150
200	12	7/8	* 150	200	12	7/8	* 170
250	16	1	* 170	250	16	1	* 190
300	16	1 1/8	* 190	300	16	1 1/8	* 210
350	20	1 1/8	* 200	350	20	1 1/8	* 220
400	20	1 1/4	* 210	400	20	1 1/4	* 240
450	24	1 1/4	* 220	450	24	1 1/4	* 250
500	24	1 1/4	* 230	500	24	1 1/4	* 260
600	24	1 1/2	* 260	600	24	1 1/2	* 300

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.0M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.108.1		
GASKET, RF TANGED INSERT	1	85.30.01.104.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.053.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.602.1		

* DRAIN POINT		DN 20	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.112.1		
GASKET, RF TANGED INSERT	1	85.30.01.106.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.054.1		
STUD BOLT WITH NUTS	4	81.38.66.269.1		
WELDING NECK FLANGE	1	76.62.78.604.1		

* ORIFICE INSTR.CONN.		DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	4	85.30.01.104.1		
GATE VALVE FLANGED	2	77.20.04.053.1		
LAP-JOINT FLANGE	2	76.62.20.308.1		
STUD BOLT WITH NUTS	8	81.38.66.155.1		
	8	81.38.66.155.1		
WELDING NECK FLANGE	2	76.62.78.602.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	1	85.30.01.104.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.14.053.1		
LAP-JOINT FLANGE	1	76.62.20.308.1		
PIPE NIPPLE 50MM	1	76.30.54.031.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.602.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	2	85.30.01.104.1		
GATE VALVE FLANGED	1	77.20.04.053.1		
LAP-JOINT FLANGE	1	76.62.20.308.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
	4	81.38.66.155.1		

* METERRUN INSTR. CONN		DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, RF TANGED INSERT	4	85.30.01.104.1		
GATE VALVE FLANGED	2	77.20.04.053.1		
LAP-JOINT FLANGE	2	76.62.20.308.1		
STUD BOLT WITH NUTS	8	81.38.66.155.1		
	8	81.38.66.155.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1		
GASKET, RF TANGED INSERT	1	85.30.01.112.1		
STUD BOLT WITH NUTS	4	81.38.66.330.1		
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1		
GASKET, RF TANGED INSERT	1	85.30.01.112.1		
STUD BOLT WITH NUTS	4	81.38.66.330.1		
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1		

* VENT POINT		DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.108.1		
GASKET, RF TANGED INSERT	1	85.30.01.104.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.053.1		
STUD BOLT WITH NUTS	4	81.38.66.155.1		
WELDING NECK FLANGE	1	76.62.78.602.1		

* VENT POINT		DN 20	FIG.1M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.112.1		
GASKET, RF TANGED INSERT	1	85.30.01.106.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.054.1		
STUD BOLT WITH NUTS	4	81.38.66.269.1		
WELDING NECK FLANGE	1	76.62.78.604.1		

CLASS 31021

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR AMMONIA, SODIUM, SODIUM-CARBONATE AND SODIUM-SULPHITE SERVICES, THROUGH-VISION LEVELGAUGES SHALL BE USED ONLY. PTFE-SHIELDS SHALL BE APPLIED.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- USE SPIRAL WOUND GASKETS (CLASS 31300), IF GRAPHITE TANGED INSERT GASKETS ARE NOT ALLOWED DUE TO PRODUCT CONTAMINATION
- API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	A					50	40
300	C	C	C	C	E	E	E	E	E	E	A						80	40
250	C	C	C	C	E	E	E	E	E	A							100	40
200	C	C	C	C	E	E	E	E	A								150	40
150	C	C	C	C	E	E	E	A									200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	30
40	C	B	B	A													400	30
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 31021	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31021, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																	
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)	74.13.14								211.1	241.1	283.1	325.1	377.1	425.1	469.1	521.1	
PIPE (API 5L-B, SAW)	74.13.17																569.1
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	469.1	521.1	569.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE	76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE	76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1						
CHECK VALVE FLANGED	77.10.05	053.1	054.1	055.1	057.1												
	77.10.20					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE SOCKET WELD	77.11.04	003.1	004.1	005.1	007.1												
GATE VALVE FLANGED	77.20.20								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED	77.30.05	053.1	054.1	055.1	057.1												
	77.30.20					058.1	060.1	062.1	064.1	065.1							
GLOBE VALVE SOCKET WELD	77.31.04	003.1	004.1	005.1	007.1												
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN	76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
STRAINER Y-TYPE	76.83.19					452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.370.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.382.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.394.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.404.1	29.46.752.1	29.61.752.1	
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.464.1	30.72.452.1	30.73.452.1	30.89.478.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.480.1	30.72.461.1	30.73.461.1	30.89.504.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.494.1	30.72.473.1	30.73.473.1	30.89.530.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.506.1	30.72.484.1	30.73.484.1	30.89.555.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.279.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.291.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.303.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.313.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.109.1	30.72.509.1	30.73.509.1	
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.116.1	30.72.532.1	30.73.532.1	
150* 50	79.00.814.1				450*300	79.00.122.1	30.72.562.1	30.73.562.1	
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.127.1	30.72.594.1	30.73.594.1	
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.131.1	30.72.624.1	30.73.624.1	
200* 50	79.00.366.1				500* 50	79.00.280.1			
200* 80	79.00.378.1				500* 80	79.00.292.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.304.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.314.1			
250* 50	79.00.367.1				500*200	79.00.110.1	29.46.909.1	29.61.909.1	
250* 80	79.00.379.1				500*250	79.00.117.1	30.72.639.1	30.73.639.1	
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.123.1	30.72.652.1	30.73.652.1	
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.128.1	30.72.684.1	30.73.684.1	
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.132.1	30.72.714.1	30.73.714.1	
300* 50	79.00.368.1				500*450	79.00.250.1	30.72.731.1	30.73.731.1	30.89.818.1
300* 80	79.00.380.1				600* 50	79.00.282.1			
300*100	79.00.392.1				600* 80	79.00.294.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.306.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.316.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.111.1			
350* 50	79.00.369.1				600*250	79.00.118.1	30.72.809.1	30.73.809.1	
350* 80	79.00.381.1				600*300	79.00.124.1	30.72.829.1	30.73.829.1	
350*100	79.00.393.1				600*350	79.00.129.1	30.72.849.1	30.73.849.1	
350*150	79.00.403.1	30.72.412.1	30.73.412.1	30.89.378.1	600*400	79.00.133.1	30.72.894.1	30.73.894.1	
350*200	79.00.462.1	30.72.421.1	30.73.421.1	30.89.389.1	600*450	79.00.254.1	30.72.911.1	30.73.911.1	30.89.938.1
350*250	79.00.478.1	30.72.433.1	30.73.433.1	30.89.414.1	600*500	79.00.260.1	30.72.941.1	30.73.941.1	30.89.962.1
350*300	79.00.492.1	30.72.443.1	30.73.443.1	30.89.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	101.1	001.1
	200-600	102.1	002.1
20	40- 80	103.1	003.1
	100-600	104.1	004.1
25	40- 40	105.1	005.1
	50- 50	106.1	006.1
	80-100	107.1	007.1
	150-600	108.1	008.1
40	50- 50	110.1	009.1
	80- 80	111.1	010.1
	100-100	112.1	011.1
	150-300	113.1	013.1
	350-600	114.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.062.1	450	76.81.65.562.1
840	76.81.65.064.1	840	76.81.65.564.1
1230	76.81.65.066.1	1230	76.81.65.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.062.1	230	76.83.37.101.1
813	76.80.60.064.1	255	76.83.37.102.1
1219	76.80.60.066.1	305	76.83.37.103.1
1524	76.80.60.068.1	355	76.83.37.105.1
1829	76.80.60.070.1	405	76.83.37.106.1
2134	76.80.60.072.1	455	76.83.37.107.1
2438	76.80.60.074.1		
2743	76.80.60.076.1		
3048	76.80.60.078.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.00.03.103.1	
BLIND FLANGE		1	76.62.11.108.1	
GASKET, RF TANGED INSERT		2	85.30.01.104.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
WELDING NECK FLANGE		1	76.62.78.602.1	

* DRAIN POINT		DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.00.03.104.1	
BLIND FLANGE		1	76.62.11.112.1	
GASKET, RF TANGED INSERT		2	85.30.01.106.1	
STUD BOLT WITH NUTS		8	81.38.61.269.1	
WELDING NECK FLANGE		1	76.62.78.604.1	

* DRAIN POINT		DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.00.03.104.1	
BLIND FLANGE		1	76.62.11.112.1	
GASKET, RF TANGED INSERT		2	85.30.01.106.1	
STUD BOLT WITH NUTS		8	81.38.61.269.1	

* ORIFICE INSTR.CONN.		DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		2	77.00.03.103.1	
GASKET, RF TANGED INSERT		4	85.30.01.104.1	
LAP-JOINT FLANGE		2	76.62.20.308.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
WELDING NECK FLANGE		2	76.62.78.602.1	

* PRESSURE INSTR.CONN.		DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.00.03.103.1	
GASKET, RF TANGED INSERT		2	85.30.01.104.1	
LAP-JOINT FLANGE		1	76.62.20.308.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
WELDING NECK FLANGE		4	81.38.61.155.1	
		1	76.62.78.602.1	

* PRESSURE INSTR.CONN.		DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.00.03.103.1	
GASKET, RF TANGED INSERT		2	85.30.01.104.1	
LAP-JOINT FLANGE		1	76.62.20.308.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
		4	81.38.61.155.1	

* METERRUN INSTR. CONN		DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		2	77.00.03.103.1	
GASKET, RF TANGED INSERT		4	85.30.01.104.1	
LAP-JOINT FLANGE		2	76.62.20.308.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
		8	81.38.61.155.1	

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.533.1	
GASKET, RF TANGED INSERT		1	85.30.01.112.1	
STUD BOLT WITH NUTS		4	81.38.61.330.1	
THERMOWELL STRAIGHT		L=230 MM	1	76.83.37.101.1

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.533.1	
GASKET, RF TANGED INSERT		1	85.30.01.112.1	
STUD BOLT WITH NUTS		4	81.38.61.330.1	
THERMOWELL STRAIGHT		L=255 MM	1	76.83.37.102.1

* VENT POINT		DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.11.108.1	
GASKET, RF TANGED INSERT		2	85.30.01.104.1	
GLOBE VALVE FLANGED		1	77.30.05.053.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
WELDING NECK FLANGE		1	76.62.78.602.1	

* VENT POINT		DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.11.112.1	
GASKET, RF TANGED INSERT		2	85.30.01.106.1	
GLOBE VALVE FLANGED		1	77.30.05.054.1	
STUD BOLT WITH NUTS		8	81.38.61.269.1	
WELDING NECK FLANGE		1	76.62.78.604.1	

* VENT POINT		DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.11.112.1	
GASKET, RF TANGED INSERT		2	85.30.01.106.1	
GLOBE VALVE FLANGED		1	77.30.05.054.1	
STUD BOLT WITH NUTS		8	81.38.61.269.1	

CLASS 31023

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR AMMONIA, SODIUM, SODIUM-CARBONATE AND SODIUM-SULPHITE SERVICES, THROUGH-VISION LEVELGAUGES SHALL BE USED ONLY. PTFE-SHIELDS SHALL BE APPLIED.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	D	E	E	E	E	E	A					50	40
300	C	C	C	C	E	E	E	E	E	E	A						80	40
250	C	C	C	C	D	D	D	D	A								100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	A									200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	30
40	C	B	B	A													400	30
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT	PLANT	:	
CLASS NO. : 31023		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY :		
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO. :		
REV. DATE : 12/96		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 31023, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC TRIM: AISI 316 (L) ,PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	469.1	521.1	569.1
PIPE NIPPLE	50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.08	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1						
CHECK VALVE FLANGED		77.10.12	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.36								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.12	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.96					140.1	142.1	044.1	046.1	020.1	022.1	024.1	026.1	028.1	014.1	016.1	018.1
STRAINER Y-TYPE		76.83.19					352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1	368.1			

BROB					RECB					REEB					TERB					BROB					RECB					REEB					TERB					BNIF					BNIP																													
76.					76.					76.					76.					76.					76.					76.					76.					76.80.37					76.80.31																													
RUN* BR																														BRANCH					RUN-PIPE																																							
20* 15					30.72.137.1					30.73.137.1					30.89.035.1					400* 50					79.00.370.1																				15					40-150					101.1					001.1														
25* 15					30.72.147.1					30.73.147.1					30.89.045.1					400* 80					79.00.382.1																				200-600					102.1					002.1																			
25* 20					30.72.157.1					30.73.157.1					30.89.055.1					400*100					79.00.394.1																				20					40- 80					103.1					003.1														
40* 15					30.72.167.1					30.73.167.1					30.89.065.1					400*150					79.00.404.1					29.46.752.1					29.61.752.1															100-600					104.1					004.1														
40* 20					30.72.177.1					30.73.177.1					30.89.075.1					400*200					79.00.464.1					30.72.452.1					30.73.452.1					30.89.478.1															25					40- 40					105.1					005.1				
40* 25					30.72.187.1					30.73.187.1					30.89.085.1					400*250					79.00.480.1					30.72.461.1					30.73.461.1					30.89.504.1															50- 50					106.1					006.1									
50* 20					29.46.192.1					29.61.192.1					30.89.100.1					400*300					79.00.494.1					30.72.473.1					30.73.473.1					30.89.530.1															80-100					107.1					007.1									
50* 25					30.72.196.1					30.73.196.1					30.89.109.1					400*350					79.00.506.1					30.72.484.1					30.73.484.1					30.89.555.1															150-600					108.1					008.1									
50* 40					30.72.206.1					30.73.206.1					30.89.118.1					450* 50					79.00.279.1																									40					50- 50					110.1					009.1									
80* 40					30.72.226.1					30.73.226.1					30.89.127.1					450* 80					79.00.291.1																														80- 80					111.1					010.1									
80* 50					79.00.810.1					30.72.235.1					30.73.235.1					30.89.132.1					450*100					79.00.303.1																									100-100					112.1					011.1									
100* 40										30.72.250.1					30.73.250.1					30.89.145.1					450*150					79.00.313.1																									150-300					113.1					013.1									
100* 50					79.00.812.1					30.72.265.1					30.73.265.1					30.89.153.1					450*200					79.00.109.1					30.72.509.1					30.73.509.1															350-600					114.1					014.1									
100* 80					79.00.836.1					30.72.275.1					30.73.275.1					30.89.165.1					450*250					79.00.116.1					30.72.532.1					30.73.532.1																																		
150* 50					79.00.814.1															450*300					79.00.122.1					30.72.562.1					30.73.562.1																																							
150* 80					79.00.838.1					30.72.295.1					30.73.295.1					30.89.177.1					450*350					79.00.127.1					30.72.594.1					30.73.594.1																																		
150*100					79.00.860.1					30.72.305.1					30.73.305.1					30.89.189.1					450*400					79.00.131.1					30.72.624.1					30.73.624.1																																		
200* 50					79.00.366.1															500* 50					79.00.280.1																																																	
200* 80					79.00.378.1															500* 80					79.00.292.1																																																	
200*100					79.00.390.1					30.72.324.1					30.73.324.1					30.89.211.1					500*100					79.00.304.1																																												
200*150					79.00.400.1					30.72.334.1					30.73.334.1					30.89.231.1					500*150					79.00.314.1																																												
250* 50					79.00.367.1															500*200					79.00.110.1					29.46.909.1					29.61.909.1															LEVEL					DISPLACER					CHAMBER					THERMOW									
250* 80					79.00.379.1															500*250					79.00.117.1					30.72.639.1					30.73.639.1															LENGTH					MESCNUMBER					LENGTH														
250*100					79.00.391.1					29.46.342.1					29.61.342.1					30.89.259.1					500*300					79.00.123.1					30.72.652.1					30.73.652.1																																		
250*150					79.00.401.1					30.72.352.1					30.73.352.1					30.89.277.1					500*350					79.00.128.1					30.72.684.1					30.73.684.1															356					76.80.59.062.1					230									
250*200					79.00.458.1					30.72.363.1					30.73.363.1					30.89.290.1					500*400					79.00.132.1					30.72.714.1					30.73.714.1															813					76.80.59.064.1					255									
300* 50					79.00.368.1															500*450					79.00.250.1					30.72.731.1					30.73.731.1					30.89.818.1															1219					76.80.59.066.1					305									
300* 80					79.00.380.1															600* 50					79.00.282.1																									1524					76.80.59.068.1					355														
300*100					79.00.392.1															600* 80					79.00.294.1																									1829					76.80.59.070.1					405														
300*150					79.00.402.1					30.72.381.1					30.73.381.1					30.89.316.1					600*100					79.00.306.1																				2134					76.80.59.072.1					455														
300*200					79.00.460.1					30.72.394.1					30.73.394.1					30.89.327.1					600*150					79.00.316.1																				2438					76.80.59.074.1																			
300*250					79.00.476.1					30.72.403.1					30.73.403.1					30.89.349.1					600*200					79.00.111.1																				2743					76.80.59.076.1																			
350* 50					79.00.369.1															600*250					79.00.118.1					30.72.809.1					30.73.809.1															3048					76.80.59.078.1																			
350* 80					79.00.381.1															600*300					79.00.124.1					30.72.829.1					30.73.829.1																																							
350*100					79.00.393.1															600*350					79.00.129.1					30.72.849.1					30.73.849.1																																							
350*150					79.00.403.1					30.72.412.1					30.73.412.1					30.89.378.1					600*400					79.00.133.1					30.72.894.1					30.73.894.1																																		
350*200					79.00.462.1					30.72.421.1					30.73.421.1					30.89.389.1					600*450					79.00.254.1					30.72.911.1					30.73.911.1					30.89.938.1																													
350*250					79.00.478.1					30.72.433.1					30.73.433.1					30.89.414.1					600*500					79.00.260.1					30.72.941.1					30.73.941.1					30.89.962.1																													
350*300					79.00.492.1					30.72.443.1					30.73.443.1					30.89.440.1																																																						

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.59.062.1	230	76.83.37.101.1
813	76.80.59.064.1	255	76.83.37.102.1
1219	76.80.59.066.1	305	76.83.37.103.1
1524	76.80.59.068.1	355	76.83.37.105.1
1829	76.80.59.070.1	405	76.83.37.106.1
2134	76.80.59.072.1	455	76.83.37.107.1
2438	76.80.59.074.1		
2743	76.80.59.076.1		
3048	76.80.59.078.1		

COMP.	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1		
BLIND FLANGE	1	76.62.11.108.1		
GASKET, RF TANGED INSERT	2	85.30.01.104.1		
STUD BOLT WITH NUTS	8	81.38.61.155.1		
WELDING NECK FLANGE	1	76.62.78.602.1		

* DRAIN POINT		DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	1	77.00.08.104.1		
BLIND FLANGE	1	76.62.11.112.1		
GASKET, RF TANGED INSERT	2	85.30.01.106.1		
STUD BOLT WITH NUTS	8	81.38.61.269.1		
WELDING NECK FLANGE	1	76.62.78.604.1		

* DRAIN POINT		DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	1	77.00.08.104.1		
BLIND FLANGE	1	76.62.11.112.1		
GASKET, RF TANGED INSERT	2	85.30.01.106.1		
STUD BOLT WITH NUTS	8	81.38.61.269.1		

* ORIFICE INSTR.CONN.		DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	2	77.00.08.103.1		
GASKET, RF TANGED INSERT	4	85.30.01.104.1		
LAP-JOINT FLANGE	2	76.62.20.308.1		
STUD BOLT WITH NUTS	8	81.38.61.155.1		
	8	81.38.61.155.1		
WELDING NECK FLANGE	2	76.62.78.602.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1		
GASKET, RF TANGED INSERT	2	85.30.01.104.1		
LAP-JOINT FLANGE	1	76.62.20.308.1		
STUD BOLT WITH NUTS	4	81.38.61.155.1		
	4	81.38.61.155.1		
WELDING NECK FLANGE	1	76.62.78.602.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1		
GASKET, RF TANGED INSERT	2	85.30.01.104.1		
LAP-JOINT FLANGE	1	76.62.20.308.1		
STUD BOLT WITH NUTS	4	81.38.61.155.1		
	4	81.38.61.155.1		

* METERRUN INSTR. CONN		DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BALL VALVE RED. BORE FLANGED	2	77.00.08.103.1		
GASKET, RF TANGED INSERT	4	85.30.01.104.1		
LAP-JOINT FLANGE	2	76.62.20.308.1		
STUD BOLT WITH NUTS	8	81.38.61.155.1		
	8	81.38.61.155.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1		
GASKET, RF TANGED INSERT	1	85.30.01.112.1		
STUD BOLT WITH NUTS	4	81.38.61.330.1		
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1		
GASKET, RF TANGED INSERT	1	85.30.01.112.1		
STUD BOLT WITH NUTS	4	81.38.61.330.1		
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1		

* VENT POINT		DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.108.1		
GASKET, RF TANGED INSERT	2	85.30.01.104.1		
GLOBE VALVE FLANGED	1	77.30.12.053.1		
STUD BOLT WITH NUTS	8	81.38.61.155.1		
WELDING NECK FLANGE	1	76.62.78.602.1		

* VENT POINT		DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.112.1		
GASKET, RF TANGED INSERT	2	85.30.01.106.1		
GLOBE VALVE FLANGED	1	77.30.12.054.1		
STUD BOLT WITH NUTS	8	81.38.61.269.1		
WELDING NECK FLANGE	1	76.62.78.604.1		

* VENT POINT		DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.11.112.1		
GASKET, RF TANGED INSERT	2	85.30.01.106.1		
GLOBE VALVE FLANGED	1	77.30.12.054.1		
STUD BOLT WITH NUTS	8	81.38.61.269.1		

CLASS 31025

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	75	100	125	150	175	200	210
	PRESSURE BAR GA								
DN15 -50	50.0	49.0	48.0	44.1	35.1	26.5	17.8	8.5	5.5
DN80 -100	42.0	42.0	42.0	39.0	32.0	24.0	17.0	8.5	5.5
DN150-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0	4.7

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING AND API609 CAT.B BUTTERFLY VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A	25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A		40	160
350	C	C	C	C	E	E	E	E	E	E	E	A				50	80
300	C	C	C	C	E	E	E	E	E	E	A					80	80
250	C	C	C	C	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	A							150	80
150	C	C	C	C	D	D	D	A								200	40
100	C	C	C	C	D	D	A									250	40
80	C	C	C	C	D	A										300	40
50	C	C	C	B	A											350	40
40	C	B	B	A												400	40
25	B	B	A													450	40
20	B	A														500	40
15	A															600	40

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT SOUR	PLANT	:	
CLASS NO. : 31025		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY :		
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO. :		
REV. DATE : 12/98		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31025, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC TRIM: AISI 316 (L) ,PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC TRIM: AISI 316 (L) ,PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L)
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWGS	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	431.1	483.1	533.1	583.1
PIPE NIPPLE	50MM	76.30.54	036.1	046.1	056.1	076.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.37	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
* VALVES																		
BALL VALVE FULL BORE FLANGED		77.00.08	653.1	654.1	655.1	657.1	658.1	660.1	662.1	664.1								
BALL VALVE RED. BORE FLANGED		77.00.08	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1								
BUTTERFLY VALVE WAFER TYPE		77.57.54								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	072.1
CHECK VALVE FLANGED		77.10.12	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.12	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.96					190.1	192.1	094.1	096.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1
STRAINER Y-TYPE		76.83.22					376.1	378.1	380.1	382.1	384.1	386.1	388.1	390.1	392.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.01.074.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.01.098.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.01.120.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.01.140.1	29.47.754.1	29.62.754.1	30.88.469.1
40* 20		30.66.181.1	30.67.181.1		400*200	79.00.908.1	30.66.453.1	30.67.453.1	30.88.479.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250	79.00.924.1	30.66.462.1	30.67.462.1	30.88.505.1
50* 20		30.66.193.1	30.67.193.1	30.88.102.1	400*300	79.00.938.1	30.66.474.1	30.67.474.1	30.88.531.1
50* 25		30.66.199.1	30.67.199.1	30.88.111.1	400*350	79.00.950.1	30.66.487.1	30.67.487.1	30.88.556.1
50* 40		30.66.208.1	30.67.208.1	30.88.120.1	450* 50	79.01.076.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450* 80	79.01.100.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*100	79.01.122.1			
100* 40		30.66.253.1	30.67.253.1	30.88.147.1	450*150	79.01.142.1			
100* 50	79.01.362.1	30.66.267.1	30.67.267.1	30.88.154.1	450*200	79.00.910.1	30.66.503.1	30.67.503.1	30.88.580.1
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1	450*250	79.00.926.1	30.66.523.1	30.67.523.1	30.88.604.1
150* 50	79.01.364.1				450*300	79.00.940.1	30.66.553.1	30.67.553.1	30.88.628.1
150* 80	79.01.388.1	30.66.297.1	30.67.297.1	30.88.178.1	450*350	79.00.952.1	30.66.584.1	30.67.584.1	30.88.652.1
150*100	79.01.410.1	30.66.307.1	30.67.307.1	30.88.190.1	450*400	79.00.962.1	30.66.614.1	30.67.614.1	30.88.676.1
200* 50	79.01.066.1				500* 50	79.01.078.1			
200* 80	79.01.090.1				500* 80	79.01.102.1			
200*100	79.01.112.1	30.66.326.1	30.67.326.1	30.88.212.1	500*100	79.01.124.1			
200*150	79.01.132.1	30.66.336.1	30.67.336.1	30.88.232.1	500*150	79.01.144.1			
250* 50	79.01.068.1				500*200	79.00.912.1	29.47.902.1	29.62.902.1	30.88.700.1
250* 80	79.01.092.1				500*250	79.00.928.1	30.66.635.1	30.67.635.1	30.88.724.1
250*100	79.01.114.1	29.47.344.1	29.62.344.1	30.88.260.1	500*300	79.00.942.1	30.66.643.1	30.67.643.1	30.88.748.1
250*150	79.01.134.1	30.66.356.1	30.67.356.1	30.88.278.1	500*350	79.00.954.1	30.66.674.1	30.67.674.1	30.88.772.1
250*200	79.00.902.1	30.66.365.1	30.67.365.1	30.88.291.1	500*400	79.00.964.1	30.66.704.1	30.67.704.1	30.88.796.1
300* 50	79.01.070.1				500*450	79.00.972.1	30.66.734.1	30.67.734.1	30.88.820.1
300* 80	79.01.094.1				600* 50	79.01.082.1			
300*100	79.01.116.1				600* 80	79.01.106.1			
300*150	79.01.136.1	30.66.380.1	30.67.380.1	30.88.317.1	600*100	79.01.128.1			
300*200	79.00.904.1	30.66.396.1	30.67.396.1	30.88.328.1	600*150	79.01.148.1			
300*250	79.00.920.1	30.66.404.1	30.67.404.1	30.88.350.1	600*200	79.00.916.1			
350* 50	79.01.072.1				600*250	79.00.932.1	30.66.803.1	30.67.803.1	30.88.844.1
350* 80	79.01.096.1				600*300	79.00.946.1	30.66.823.1	30.67.823.1	30.88.868.1
350*100	79.01.118.1				600*350	79.00.958.1	30.66.843.1	30.67.843.1	30.88.892.1
350*150	79.01.138.1	29.47.604.1	29.62.604.1	30.88.379.1	600*400	79.00.968.1	30.66.884.1	30.67.884.1	30.88.916.1
350*200	79.00.906.1	30.66.422.1	30.67.422.1	30.88.390.1	600*450	79.00.976.1	30.66.914.1	30.67.914.1	30.88.940.1
350*250	79.00.922.1	30.66.438.1	30.67.438.1	30.88.415.1	600*500	79.00.982.1	30.66.944.1	30.67.944.1	30.88.964.1
350*300	79.00.936.1	30.66.447.1	30.67.447.1	30.88.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	121.1	016.1
20	40-600	123.1	018.1
25	40-100	125.1	020.1
	150-600	126.1	024.1
40	50-100	130.1	026.1
	150-600	131.1	028.1

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET API609 BFLY VALVE

BOLTSET FLANGED JOINTS

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	

					15	4	1/2	* 70	66.155.1
					20	4	5/8	* 80	66.269.1
					25	4	5/8	* 80	66.269.1
					40	4	3/4	* 90	66.327.1
					50	8	5/8	* 90	66.271.1
80	8	3/4	* 100	66.329.1	80	8	3/4	* 110	66.330.1
100	8	3/4	* 100	66.329.1	100	8	3/4	* 120	66.332.1
150	12	3/4	* 110	66.330.1	150	12	3/4	* 130	66.334.1
200	12	7/8	* 130	66.403.1	200	12	7/8	* 140	66.404.1
250	16	1	* 140	66.469.1	250	16	1	* 160	66.472.1
300	16	1 1/8	* 160	66.530.1	300	16	1 1/8	* 170	66.532.1
350	20	1 1/8	* 180	66.533.1	350	20	1 1/8	* 180	66.533.1
400	24	1 1/4	* 210	66.595.1	400	20	1 1/4	* 190	66.592.1
450	24	1 1/4	* 220	66.597.1	450	24	1 1/4	* 200	66.588.1
500	24	1 1/4	* 230	66.598.1	500	24	1 1/4	* 210	66.595.1
600	24	1 1/2	* 270	66.682.1	600	24	1 1/2	* 240	66.687.1

BOLTSET METER-RUN

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	

15	4	1/2	* 70	66.155.1	15	4	1/2	* 80	66.157.1
20	4	5/8	* 80	66.269.1	20	4	5/8	* 90	66.271.1
25	4	5/8	* 90	66.271.1	25	4	5/8	* 90	66.271.1
40	4	3/4	* 100	66.329.1	40	4	3/4	* 100	66.329.1
					50	8	5/8	* 100	66.273.1
					80	8	3/4	* 120	66.332.1
					100	8	3/4	* 130	66.334.1
					150	12	3/4	* 150	66.337.1
					200	12	7/8	* 170	66.409.1
					250	16	1	* 190	66.477.1
					300	16	1 1/8	* 210	66.538.1
					350	20	1 1/8	* 220	66.540.1
					400	20	1 1/4	* 240	66.600.1
					450	24	1 1/4	* 250	66.609.1
					500	24	1 1/4	* 260	66.603.1
					600	24	1 1/2	* 300	66.696.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.104.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.66.269.1	
WELDING NECK FLANGE	1	76.62.78.654.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.104.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.66.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
	8	81.38.66.155.1	
WELDING NECK FLANGE	2	76.62.78.652.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
	4	81.38.66.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
	8	81.38.66.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.30.12.053.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.12.054.1	
STUD BOLT WITH NUTS	8	81.38.66.269.1	
WELDING NECK FLANGE	1	76.62.78.654.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.12.054.1	
STUD BOLT WITH NUTS	8	81.38.66.269.1	

CLASS 31031

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	51.0	50.0	46.3	45.1	43.8	41.8	38.8	36.8	33.6

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL
(AMBIENT TO FLUID) 265 DEG. C.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 160
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	200 40
100	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	250 40
80	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	300 40
50	C	C	C	B	A												350 40
40	C	B	B	A													400 40
25	B	B	A														450 40
20	B	A															500 40
15	A																600 40

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 31031	CONSIGNEE	:	
ANS RATING : CLASS 300	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 31031, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
		DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	431.1	483.1	533.1	583.1
PIPE NIPPLE 50MM		76.30.57	436.1	446.1	456.1	476.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	098.1	118.1	135.1	155.1	178.1	197.1	218.1	240.1	260.1	280.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	053.1	054.1	055.1	057.1												
		77.10.20					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.04	053.1	054.1	055.1	057.1												
		77.20.20					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.05	053.1	054.1	055.1	057.1												
		77.30.20					058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
STRAINER Y-TYPE		76.83.19					476.1	478.1	480.1	482.1	484.1	486.1	488.1	490.1	492.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.074.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.098.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.120.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.140.1	29.46.754.1	29.61.754.1	30.89.469.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.00.908.1	30.72.453.1	30.73.453.1	30.89.479.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.00.924.1	30.72.462.1	30.73.462.1	30.89.505.1
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*300	79.00.938.1	30.72.474.1	30.73.474.1	30.89.531.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	400*350	79.00.950.1	30.72.487.1	30.73.487.1	30.89.556.1
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 50	79.01.076.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.100.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.122.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.142.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.00.910.1	30.72.503.1	30.73.503.1	30.89.580.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.00.926.1	30.72.523.1	30.73.523.1	30.89.604.1
150* 50	79.01.364.1				450*300	79.00.940.1	30.72.553.1	30.73.553.1	30.89.628.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.00.952.1	30.72.584.1	30.73.584.1	30.89.652.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.00.962.1	30.72.614.1	30.73.614.1	30.89.676.1
200* 50	79.01.066.1				500* 50	79.01.078.1			
200* 80	79.01.090.1				500* 80	79.01.102.1			
200*100	79.01.112.1	30.72.326.1	30.73.326.1	30.89.212.1	500*100	79.01.124.1			
200*150	79.01.132.1	30.72.336.1	30.73.336.1	30.89.232.1	500*150	79.01.144.1			
250* 50	79.01.068.1				500*200	79.00.912.1	29.46.902.1	29.61.902.1	30.89.700.1
250* 80	79.01.092.1				500*250	79.00.928.1	30.72.635.1	30.73.635.1	30.89.724.1
250*100	79.01.114.1	29.46.344.1	29.61.344.1	30.89.260.1	500*300	79.00.942.1	30.72.643.1	30.73.643.1	30.89.748.1
250*150	79.01.134.1	30.72.356.1	30.73.356.1	30.89.278.1	500*350	79.00.954.1	30.72.674.1	30.73.674.1	30.89.772.1
250*200	79.00.902.1	30.72.365.1	30.73.365.1	30.89.291.1	500*400	79.00.964.1	30.72.704.1	30.73.704.1	30.89.796.1
300* 50	79.01.070.1				500*450	79.00.972.1	30.72.734.1	30.73.734.1	30.89.820.1
300* 80	79.01.094.1				600* 50	79.01.082.1			
300*100	79.01.116.1				600* 80	79.01.106.1			
300*150	79.01.136.1	30.72.380.1	30.73.380.1	30.89.317.1	600*100	79.01.128.1			
300*200	79.00.904.1	30.72.396.1	30.73.396.1	30.89.328.1	600*150	79.01.148.1			
300*250	79.00.920.1	30.72.404.1	30.73.404.1	30.89.350.1	600*200	79.00.916.1			
350* 50	79.01.072.1				600*250	79.00.932.1	30.72.803.1	30.73.803.1	30.89.844.1
350* 80	79.01.096.1				600*300	79.00.946.1	30.72.823.1	30.73.823.1	30.89.868.1
350*100	79.01.118.1				600*350	79.00.958.1	30.72.843.1	30.73.843.1	30.89.892.1
350*150	79.01.138.1	29.46.604.1	29.61.604.1	30.89.379.1	600*400	79.00.968.1	30.72.884.1	30.73.884.1	30.89.916.1
350*200	79.00.906.1	30.72.422.1	30.73.422.1	30.89.390.1	600*450	79.00.976.1	30.72.914.1	30.73.914.1	30.89.940.1
350*250	79.00.922.1	30.72.438.1	30.73.438.1	30.89.415.1	600*500	79.00.982.1	30.72.944.1	30.73.944.1	30.89.964.1
350*300	79.00.936.1	30.72.447.1	30.73.447.1	30.89.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-600	121.1	016.1
20	40-600	123.1	018.1
25	40-100	125.1	020.1
	150-600	126.1	024.1
40	50-100	130.1	026.1
	150-600	131.1	028.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.062.1	450	76.81.65.562.1
840	76.81.65.064.1	840	76.81.65.564.1
1230	76.81.65.066.1	1230	76.81.65.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.062.1	230	76.83.37.101.1
813	76.80.60.064.1	255	76.83.37.102.1
1219	76.80.60.066.1	305	76.83.37.103.1
1524	76.80.60.068.1	355	76.83.37.105.1
1829	76.80.60.070.1	405	76.83.37.106.1
2134	76.80.60.072.1	455	76.83.37.107.1
2438	76.80.60.074.1		
2743	76.80.60.076.1		
3048	76.80.60.078.1		

COMP.	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.04.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.654.1

* DRAIN POINT DN 20 FIG.0H DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.04.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
4 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.04.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.30.05.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.05.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.654.1

* VENT POINT DN 20 FIG.1H DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.05.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 31041

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	50.5	50.0	46.3	45.1	43.8	41.8	38.8	36.8	32.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40 80
350	C	C	C	C	E	E	E	E	E	E	E	A					50 40
300	C	C	C	C	E	E	E	E	E	E	A						80 40
250	C	C	C	C	E	E	E	E	E	A							100 40
200	C	C	C	C	E	E	E	E	A								150 40
150	C	C	C	C	E	E	E	A									200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 30
40	C	B	B	A													400 30
25	B	B	A														450 30
20	B	A															500 30
15	A																600 30

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 31041	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : 0	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
CAPT	CAP THREADED	---	ASTM A105
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	236.1	257.1	278.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.04	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
STRAINER Y-TYPE		76.83.19					452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.370.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.382.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.394.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.404.1	29.46.752.1	29.61.752.1	
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.464.1	30.72.452.1	30.73.452.1	30.89.478.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.480.1	30.72.461.1	30.73.461.1	30.89.504.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.494.1	30.72.473.1	30.73.473.1	30.89.530.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.506.1	30.72.484.1	30.73.484.1	30.89.555.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.371.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.383.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.395.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.405.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.466.1	30.72.502.1	30.73.502.1	30.89.579.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.482.1	30.72.521.1	30.73.521.1	30.89.603.1
150* 50	79.00.814.1				450*300	79.00.496.1	30.72.551.1	30.73.551.1	30.89.627.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.508.1	30.72.582.1	30.73.582.1	30.89.651.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.518.1	30.72.612.1	30.73.612.1	30.89.675.1
200* 50	79.00.366.1				500* 50	79.00.372.1			
200* 80	79.00.378.1				500* 80	79.00.384.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.396.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.406.1			
250* 50	79.00.367.1				500*200	79.00.468.1	29.46.901.1	29.61.901.1	30.89.699.1
250* 80	79.00.379.1				500*250	79.00.484.1	30.72.634.1	30.73.634.1	30.89.723.1
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.498.1	30.72.641.1	30.73.641.1	30.89.747.1
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.510.1	30.72.672.1	30.73.672.1	30.89.771.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.520.1	30.72.702.1	30.73.702.1	30.89.795.1
300* 50	79.00.368.1				500*450	79.00.528.1	30.72.732.1	30.73.732.1	30.89.819.1
300* 80	79.00.380.1				600* 50	79.00.374.1			
300*100	79.00.392.1				600* 80	79.00.386.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.398.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.408.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.472.1			
350* 50	79.00.369.1				600*250	79.00.488.1	30.72.802.1	30.73.802.1	30.89.843.1
350* 80	79.00.381.1				600*300	79.00.502.1	30.72.822.1	30.73.822.1	30.89.867.1
350*100	79.00.393.1				600*350	79.00.514.1	30.72.842.1	30.73.842.1	30.89.891.1
350*150	79.00.403.1	30.72.412.1	30.73.412.1	30.89.378.1	600*400	79.00.524.1	30.72.882.1	30.73.882.1	30.89.915.1
350*200	79.00.462.1	30.72.421.1	30.73.421.1	30.89.389.1	600*450	79.00.532.1	30.72.912.1	30.73.912.1	30.89.939.1
350*250	79.00.478.1	30.72.433.1	30.73.433.1	30.89.414.1	600*500	79.00.538.1	30.72.942.1	30.73.942.1	30.89.963.1
350*300	79.00.492.1	30.72.443.1	30.73.443.1	30.89.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	101.1	001.1
	200-600	102.1	002.1
20	40- 80	103.1	003.1
	100-600	104.1	004.1
25	40- 40	105.1	005.1
	50- 50	106.1	006.1
	80-100	107.1	007.1
	150-600	108.1	008.1
40	50- 50	110.1	009.1
	80- 80	111.1	010.1
	100-100	112.1	011.1
	150-300	113.1	013.1
	350-600	114.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.062.1	450	76.81.65.562.1
840	76.81.65.064.1	840	76.81.65.564.1
1230	76.81.65.066.1	1230	76.81.65.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.062.1	230	76.83.37.101.1
813	76.80.60.064.1	255	76.83.37.102.1
1219	76.80.60.066.1	305	76.83.37.103.1
1524	76.80.60.068.1	355	76.83.37.105.1
1829	76.80.60.070.1	405	76.83.37.106.1
2134	76.80.60.072.1	455	76.83.37.107.1
2438	76.80.60.074.1		
2743	76.80.60.076.1		
3048	76.80.60.078.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.04.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.604.1

* DRAIN POINT DN 20 FIG.0H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.04.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.04.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.62.78.602.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.04.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.30.05.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.05.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.604.1

* VENT POINT DN 20 FIG.1H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.05.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 31042

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	51.0	50.0	46.3	45.1	43.8	41.8	38.8	36.8	33.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 160
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	200 40
100	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	250 40
80	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A	300 40
50	C	C	C	B	A												350 40
40	C	B	B	A													400 40
25	B	B	A														450 40
20	B	A															500 40
15	A																600 40

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 31042	CONSIGNEE	:	
ANS RATING : CLASS 300	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : 0	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	431.1	483.1	533.1	583.1
PIPE NIPPLE	50MM	76.30.57	436.1	446.1	456.1	476.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	098.1	118.1	135.1	155.1	178.1	197.1	218.1	240.1	260.1	280.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.04	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
STRAINER Y-TYPE		76.83.19					476.1	478.1	480.1	482.1	484.1	486.1	488.1	490.1	492.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.074.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.098.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.120.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.140.1	29.46.754.1	29.61.754.1	30.89.469.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.00.908.1	30.72.453.1	30.73.453.1	30.89.479.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.00.924.1	30.72.462.1	30.73.462.1	30.89.505.1
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*300	79.00.938.1	30.72.474.1	30.73.474.1	30.89.531.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	400*350	79.00.950.1	30.72.487.1	30.73.487.1	30.89.556.1
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 50	79.01.076.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.100.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.122.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.142.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.00.910.1	30.72.503.1	30.73.503.1	30.89.580.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.00.926.1	30.72.523.1	30.73.523.1	30.89.604.1
150* 50	79.01.364.1				450*300	79.00.940.1	30.72.553.1	30.73.553.1	30.89.628.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.00.952.1	30.72.584.1	30.73.584.1	30.89.652.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.00.962.1	30.72.614.1	30.73.614.1	30.89.676.1
200* 50	79.01.066.1				500* 50	79.01.078.1			
200* 80	79.01.090.1				500* 80	79.01.102.1			
200*100	79.01.112.1	30.72.326.1	30.73.326.1	30.89.212.1	500*100	79.01.124.1			
200*150	79.01.132.1	30.72.336.1	30.73.336.1	30.89.232.1	500*150	79.01.144.1			
250* 50	79.01.068.1				500*200	79.00.912.1	29.46.902.1	29.61.902.1	30.89.700.1
250* 80	79.01.092.1				500*250	79.00.928.1	30.72.635.1	30.73.635.1	30.89.724.1
250*100	79.01.114.1	29.46.344.1	29.61.344.1	30.89.260.1	500*300	79.00.942.1	30.72.643.1	30.73.643.1	30.89.748.1
250*150	79.01.134.1	30.72.356.1	30.73.356.1	30.89.278.1	500*350	79.00.954.1	30.72.674.1	30.73.674.1	30.89.772.1
250*200	79.00.902.1	30.72.365.1	30.73.365.1	30.89.291.1	500*400	79.00.964.1	30.72.704.1	30.73.704.1	30.89.796.1
300* 50	79.01.070.1				500*450	79.00.972.1	30.72.734.1	30.73.734.1	30.89.820.1
300* 80	79.01.094.1				600* 50	79.01.082.1			
300*100	79.01.116.1				600* 80	79.01.106.1			
300*150	79.01.136.1	30.72.380.1	30.73.380.1	30.89.317.1	600*100	79.01.128.1			
300*200	79.00.904.1	30.72.396.1	30.73.396.1	30.89.328.1	600*150	79.01.148.1			
300*250	79.00.920.1	30.72.404.1	30.73.404.1	30.89.350.1	600*200	79.00.916.1			
350* 50	79.01.072.1				600*250	79.00.932.1	30.72.803.1	30.73.803.1	30.89.844.1
350* 80	79.01.096.1				600*300	79.00.946.1	30.72.823.1	30.73.823.1	30.89.868.1
350*100	79.01.118.1				600*350	79.00.958.1	30.72.843.1	30.73.843.1	30.89.892.1
350*150	79.01.138.1	29.46.604.1	29.61.604.1	30.89.379.1	600*400	79.00.968.1	30.72.884.1	30.73.884.1	30.89.916.1
350*200	79.00.906.1	30.72.422.1	30.73.422.1	30.89.390.1	600*450	79.00.976.1	30.72.914.1	30.73.914.1	30.89.940.1
350*250	79.00.922.1	30.72.438.1	30.73.438.1	30.89.415.1	600*500	79.00.982.1	30.72.944.1	30.73.944.1	30.89.964.1
350*300	79.00.936.1	30.72.447.1	30.73.447.1	30.89.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	121.1	016.1
20	40-600	123.1	018.1
25	40-100	125.1	020.1
	150-600	126.1	024.1
40	50-100	130.1	026.1
	150-600	131.1	028.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.062.1	450	76.81.65.562.1
840	76.81.65.064.1	840	76.81.65.564.1
1230	76.81.65.066.1	1230	76.81.65.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.062.1	230	76.83.37.101.1
813	76.80.60.064.1	255	76.83.37.102.1
1219	76.80.60.066.1	305	76.83.37.103.1
1524	76.80.60.068.1	355	76.83.37.105.1
1829	76.80.60.070.1	405	76.83.37.106.1
2134	76.80.60.072.1	455	76.83.37.107.1
2438	76.80.60.074.1		
2743	76.80.60.076.1		
3048	76.80.60.078.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	80
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.04.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.654.1

* DRAIN POINT DN 20 FIG.0H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.04.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.04.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.62.78.652.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.04.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.04.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.30.05.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.05.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.654.1

* VENT POINT DN 20 FIG.1H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.05.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 31055

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	51.0	50.0	46.3	45.1	43.8	41.8	38.8	36.8	33.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	80
300	C	C	C	C	E	E	E	E	E	E	E						80	80
250	C	C	C	C	E	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	E	A							150	80
150	C	C	C	C	D	D	D	D	A								200	40
100	C	C	C	C	D	D	D	A									250	40
80	C	C	C	C	D	D	A										300	40
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 31055		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY	:	
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO.	:	
REV. DATE : 12/96		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
* PIPE																		
PIPE		74.30.03	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	431.1	483.1	533.1	583.1
PIPE NIPPLE	50MM	76.30.54	036.1	046.1	056.1	076.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.37	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.11.14	233.1	234.1	235.1	237.1												
CHECK VALVE FLANGED		77.10.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE BUTT-WELD ENDS		77.21.14	103.1	104.1	105.1	107.1												
GATE VALVE FLANGED		77.20.04	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	103.1	104.1	105.1	107.1												
GLOBE VALVE FLANGED		77.30.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
STRAINER Y-TYPE		76.83.22					076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.01.074.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.01.098.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.01.120.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.01.140.1	29.47.754.1	29.62.754.1	30.88.469.1
40* 20		30.66.181.1	30.67.181.1		400*200	79.00.908.1	30.66.453.1	30.67.453.1	30.88.479.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250	79.00.924.1	30.66.462.1	30.67.462.1	30.88.505.1
50* 20		30.66.193.1	30.67.193.1	30.88.102.1	400*300	79.00.938.1	30.66.474.1	30.67.474.1	30.88.531.1
50* 25		30.66.199.1	30.67.199.1	30.88.111.1	400*350	79.00.950.1	30.66.487.1	30.67.487.1	30.88.556.1
50* 40		30.66.208.1	30.67.208.1	30.88.120.1	450* 50	79.01.076.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450* 80	79.01.100.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*100	79.01.122.1			
100* 40		30.66.253.1	30.67.253.1	30.88.147.1	450*150	79.01.142.1			
100* 50	79.01.362.1	30.66.267.1	30.67.267.1	30.88.154.1	450*200	79.00.910.1	30.66.503.1	30.67.503.1	30.88.580.1
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1	450*250	79.00.926.1	30.66.523.1	30.67.523.1	30.88.604.1
150* 50	79.01.364.1				450*300	79.00.940.1	30.66.553.1	30.67.553.1	30.88.628.1
150* 80	79.01.388.1	30.66.297.1	30.67.297.1	30.88.178.1	450*350	79.00.952.1	30.66.584.1	30.67.584.1	30.88.652.1
150*100	79.01.410.1	30.66.307.1	30.67.307.1	30.88.190.1	450*400	79.00.962.1	30.66.614.1	30.67.614.1	30.88.676.1
200* 50	79.01.066.1				500* 50	79.01.078.1			
200* 80	79.01.090.1				500* 80	79.01.102.1			
200*100	79.01.112.1	30.66.326.1	30.67.326.1	30.88.212.1	500*100	79.01.124.1			
200*150	79.01.132.1	30.66.336.1	30.67.336.1	30.88.232.1	500*150	79.01.144.1			
250* 50	79.01.068.1				500*200	79.00.912.1	29.47.902.1	29.62.902.1	30.88.700.1
250* 80	79.01.092.1				500*250	79.00.928.1	30.66.635.1	30.67.635.1	30.88.724.1
250*100	79.01.114.1	29.47.344.1	29.62.344.1	30.88.260.1	500*300	79.00.942.1	30.66.643.1	30.67.643.1	30.88.748.1
250*150	79.01.134.1	30.66.356.1	30.67.356.1	30.88.278.1	500*350	79.00.954.1	30.66.674.1	30.67.674.1	30.88.772.1
250*200	79.00.902.1	30.66.365.1	30.67.365.1	30.88.291.1	500*400	79.00.964.1	30.66.704.1	30.67.704.1	30.88.796.1
300* 50	79.01.070.1				500*450	79.00.972.1	30.66.734.1	30.67.734.1	30.88.820.1
300* 80	79.01.094.1				600* 50	79.01.082.1			
300*100	79.01.116.1				600* 80	79.01.106.1			
300*150	79.01.136.1	30.66.380.1	30.67.380.1	30.88.317.1	600*100	79.01.128.1			
300*200	79.00.904.1	30.66.396.1	30.67.396.1	30.88.328.1	600*150	79.01.148.1			
300*250	79.00.920.1	30.66.404.1	30.67.404.1	30.88.350.1	600*200	79.00.916.1			
350* 50	79.01.072.1				600*250	79.00.932.1	30.66.803.1	30.67.803.1	30.88.844.1
350* 80	79.01.096.1				600*300	79.00.946.1	30.66.823.1	30.67.823.1	30.88.868.1
350*100	79.01.118.1				600*350	79.00.958.1	30.66.843.1	30.67.843.1	30.88.892.1
350*150	79.01.138.1	29.47.604.1	29.62.604.1	30.88.379.1	600*400	79.00.968.1	30.66.884.1	30.67.884.1	30.88.916.1
350*200	79.00.906.1	30.66.422.1	30.67.422.1	30.88.390.1	600*450	79.00.976.1	30.66.914.1	30.67.914.1	30.88.940.1
350*250	79.00.922.1	30.66.438.1	30.67.438.1	30.88.415.1	600*500	79.00.982.1	30.66.944.1	30.67.944.1	30.88.964.1
350*300	79.00.936.1	30.66.447.1	30.67.447.1	30.88.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	121.1	016.1
20	40-600	123.1	018.1
25	40-100	125.1	020.1
	150-600	126.1	024.1
40	50-100	130.1	026.1
	150-600	131.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.422.1			230 76.83.37.101.1
813	76.80.60.424.1			255 76.83.37.102.1
1219	76.80.60.426.1			305 76.83.37.103.1
1524	76.80.60.428.1			355 76.83.37.105.1
1829	76.80.60.430.1			405 76.83.37.106.1
2134	76.80.60.432.1			455 76.83.37.107.1
2438	76.80.60.434.1			
2743	76.80.60.436.1			
3048	76.80.60.438.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 70	15	4	1/2	* 70
20	4	5/8	* 80	20	4	5/8	* 80
25	4	5/8	* 80	25	4	5/8	* 90
40	4	3/4	* 90	40	4	3/4	* 100
50	8	5/8	* 90				
80	8	3/4	* 110				
100	8	3/4	* 120				
150	12	3/4	* 130				
200	12	7/8	* 140				
250	16	1	* 160				
300	16	1 1/8	* 170				
350	20	1 1/8	* 180				
400	20	1 1/4	* 190				
450	24	1 1/4	* 200				
500	24	1 1/4	* 210				
600	24	1 1/2	* 240				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 80
				20	4	5/8	* 90
				25	4	5/8	* 90
				40	4	3/4	* 100
50	8	5/8	* 150	50	8	5/8	* 100
80	8	3/4	* 150	80	8	3/4	* 120
100	12	3/4	* 140	100	8	3/4	* 130
150	12	3/4	* 140	150	12	3/4	* 150
200	12	7/8	* 150	200	12	7/8	* 170
250	16	1	* 170	250	16	1	* 190
300	16	1 1/8	* 190	300	16	1 1/8	* 210
350	20	1 1/8	* 200	350	20	1 1/8	* 220
400	20	1 1/4	* 210	400	20	1 1/4	* 240
450	24	1 1/4	* 220	450	24	1 1/4	* 250
500	24	1 1/4	* 230	500	24	1 1/4	* 260
600	24	1 1/2	* 260	600	24	1 1/2	* 300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* DRAIN POINT	DN 20	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	1	85.30.01.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.104.1	
STUD BOLT WITH NUTS	4	81.38.66.269.1	
WELDING NECK FLANGE	1	76.62.78.654.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE BUTT-WELD ENDS	2	77.21.14.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
WELDING NECK FLANGE	2	76.62.78.652.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
PIPE NIPPLE 50MM	1	76.30.54.036.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.20.04.053.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
	8	81.38.66.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.103.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* VENT POINT	DN 20	FIG.1M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	1	85.30.01.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.104.1	
STUD BOLT WITH NUTS	4	81.38.66.269.1	
WELDING NECK FLANGE	1	76.62.78.654.1	

CLASS 31071

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	50.5	50.0	46.3	45.1	43.8	41.8	38.8	36.8	32.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 40
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 40
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 40
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 40
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 30
40	C	B	B	A													400 30
25	B	B	A														450 30
20	B	A															500 30
15	A																600 30

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 31071	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
ITEM DESCRIPTION		MESC																

* PIPE																		
PIPE		74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
PIPE NIPPLE	50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	236.1	257.1	278.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
* VALVES																		
CHECK VALVE FLANGED		77.10.26	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.26	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.26	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
STRAINER Y-TYPE		76.83.19					452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.370.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.382.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.394.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.404.1	29.46.752.1	29.61.752.1	
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.464.1	30.72.452.1	30.73.452.1	30.89.478.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.480.1	30.72.461.1	30.73.461.1	30.89.504.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.494.1	30.72.473.1	30.73.473.1	30.89.530.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.506.1	30.72.484.1	30.73.484.1	30.89.555.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.371.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.383.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.395.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.405.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.466.1	30.72.502.1	30.73.502.1	30.89.579.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.482.1	30.72.521.1	30.73.521.1	30.89.603.1
150* 50	79.00.814.1				450*300	79.00.496.1	30.72.551.1	30.73.551.1	30.89.627.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.508.1	30.72.582.1	30.73.582.1	30.89.651.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.518.1	30.72.612.1	30.73.612.1	30.89.675.1
200* 50	79.00.366.1				500* 50	79.00.372.1			
200* 80	79.00.378.1				500* 80	79.00.384.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.396.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.406.1			
250* 50	79.00.367.1				500*200	79.00.468.1	29.46.901.1	29.61.901.1	30.89.699.1
250* 80	79.00.379.1				500*250	79.00.484.1	30.72.634.1	30.73.634.1	30.89.723.1
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.498.1	30.72.641.1	30.73.641.1	30.89.747.1
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.510.1	30.72.672.1	30.73.672.1	30.89.771.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.520.1	30.72.702.1	30.73.702.1	30.89.795.1
300* 50	79.00.368.1				500*450	79.00.528.1	30.72.732.1	30.73.732.1	30.89.819.1
300* 80	79.00.380.1				600* 50	79.00.374.1			
300*100	79.00.392.1				600* 80	79.00.386.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.398.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.408.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.472.1			
350* 50	79.00.369.1				600*250	79.00.488.1	30.72.802.1	30.73.802.1	30.89.843.1
350* 80	79.00.381.1				600*300	79.00.502.1	30.72.822.1	30.73.822.1	30.89.867.1
350*100	79.00.393.1				600*350	79.00.514.1	30.72.842.1	30.73.842.1	30.89.891.1
350*150	79.00.403.1	30.72.412.1	30.73.412.1	30.89.378.1	600*400	79.00.524.1	30.72.882.1	30.73.882.1	30.89.915.1
350*200	79.00.462.1	30.72.421.1	30.73.421.1	30.89.389.1	600*450	79.00.532.1	30.72.912.1	30.73.912.1	30.89.939.1
350*250	79.00.478.1	30.72.433.1	30.73.433.1	30.89.414.1	600*500	79.00.538.1	30.72.942.1	30.73.942.1	30.89.963.1
350*300	79.00.492.1	30.72.443.1	30.73.443.1	30.89.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	101.1	001.1
	200-600	102.1	002.1
20	40- 80	103.1	003.1
	100-600	104.1	004.1
25	40- 40	105.1	005.1
	50- 50	106.1	006.1
	80-100	107.1	007.1
	150-600	108.1	008.1
40	50- 50	110.1	009.1
	80- 80	111.1	010.1
	100-100	112.1	011.1
	150-300	113.1	013.1
	350-600	114.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.062.1		230	76.83.37.101.1
813	76.80.60.064.1		255	76.83.37.102.1
1219	76.80.60.066.1		305	76.83.37.103.1
1524	76.80.60.068.1		355	76.83.37.105.1
1829	76.80.60.070.1		405	76.83.37.106.1
2134	76.80.60.072.1		455	76.83.37.107.1
2438	76.80.60.074.1			
2743	76.80.60.076.1			
3048	76.80.60.078.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.26.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.26.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.604.1

* DRAIN POINT DN 20 FIG.0H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.26.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.26.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.62.78.602.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.26.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.26.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.26.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.30.26.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.602.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.26.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.604.1

* VENT POINT DN 20 FIG.1H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.26.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 31076

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400

		PRESSURE BAR GA								
DN15	-400	51.0	50.0	46.4	45.1	43.9	41.8	38.9	36.9	33.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	80
300	C	C	C	C	E	E	E	E	E	E	E						80	80
250	C	C	C	C	E	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	E	A							150	80
150	C	C	C	C	D	D	D	A									200	40
100	C	C	C	C	D	D	A										250	40
80	C	C	C	C	D	A											300	40
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 31076	CONSIGNEE	:	
ANS RATING : CLASS 300	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 31076, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	431.1	483.1	533.1	583.1
PIPE NIPPLE	50MM	76.30.57	436.1	446.1	456.1	476.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	098.1	118.1	135.1	155.1	178.1	197.1	218.1	240.1	260.1	280.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
* VALVES																		
CHECK VALVE FLANGED		77.10.26	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.26	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.26	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
STRAINER Y-TYPE		76.83.19					476.1	478.1	480.1	482.1	484.1	486.1	488.1	490.1	492.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.074.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.098.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.120.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.140.1	29.46.754.1	29.61.754.1	30.89.469.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.00.908.1	30.72.453.1	30.73.453.1	30.89.479.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.00.924.1	30.72.462.1	30.73.462.1	30.89.505.1
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*300	79.00.938.1	30.72.474.1	30.73.474.1	30.89.531.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	400*350	79.00.950.1	30.72.487.1	30.73.487.1	30.89.556.1
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 50	79.01.076.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.100.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.122.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.142.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.00.910.1	30.72.503.1	30.73.503.1	30.89.580.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.00.926.1	30.72.523.1	30.73.523.1	30.89.604.1
150* 50	79.01.364.1				450*300	79.00.940.1	30.72.553.1	30.73.553.1	30.89.628.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.00.952.1	30.72.584.1	30.73.584.1	30.89.652.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.00.962.1	30.72.614.1	30.73.614.1	30.89.676.1
200* 50	79.01.066.1				500* 50	79.01.078.1			
200* 80	79.01.090.1				500* 80	79.01.102.1			
200*100	79.01.112.1	30.72.326.1	30.73.326.1	30.89.212.1	500*100	79.01.124.1			
200*150	79.01.132.1	30.72.336.1	30.73.336.1	30.89.232.1	500*150	79.01.144.1			
250* 50	79.01.068.1				500*200	79.00.912.1	29.46.902.1	29.61.902.1	30.89.700.1
250* 80	79.01.092.1				500*250	79.00.928.1	30.72.635.1	30.73.635.1	30.89.724.1
250*100	79.01.114.1	29.46.344.1	29.61.344.1	30.89.260.1	500*300	79.00.942.1	30.72.643.1	30.73.643.1	30.89.748.1
250*150	79.01.134.1	30.72.356.1	30.73.356.1	30.89.278.1	500*350	79.00.954.1	30.72.674.1	30.73.674.1	30.89.772.1
250*200	79.00.902.1	30.72.365.1	30.73.365.1	30.89.291.1	500*400	79.00.964.1	30.72.704.1	30.73.704.1	30.89.796.1
300* 50	79.01.070.1				500*450	79.00.972.1	30.72.734.1	30.73.734.1	30.89.820.1
300* 80	79.01.094.1				600* 50	79.01.082.1			
300*100	79.01.116.1				600* 80	79.01.106.1			
300*150	79.01.136.1	30.72.380.1	30.73.380.1	30.89.317.1	600*100	79.01.128.1			
300*200	79.00.904.1	30.72.396.1	30.73.396.1	30.89.328.1	600*150	79.01.148.1			
300*250	79.00.920.1	30.72.404.1	30.73.404.1	30.89.350.1	600*200	79.00.916.1			
350* 50	79.01.072.1				600*250	79.00.932.1	30.72.803.1	30.73.803.1	30.89.844.1
350* 80	79.01.096.1				600*300	79.00.946.1	30.72.823.1	30.73.823.1	30.89.868.1
350*100	79.01.118.1				600*350	79.00.958.1	30.72.843.1	30.73.843.1	30.89.892.1
350*150	79.01.138.1	29.46.604.1	29.61.604.1	30.89.379.1	600*400	79.00.968.1	30.72.884.1	30.73.884.1	30.89.916.1
350*200	79.00.906.1	30.72.422.1	30.73.422.1	30.89.390.1	600*450	79.00.976.1	30.72.914.1	30.73.914.1	30.89.940.1
350*250	79.00.922.1	30.72.438.1	30.73.438.1	30.89.415.1	600*500	79.00.982.1	30.72.944.1	30.73.944.1	30.89.964.1
350*300	79.00.936.1	30.72.447.1	30.73.447.1	30.89.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	121.1	016.1
20	40-600	123.1	018.1
25	40-100	125.1	020.1
	150-600	126.1	024.1
40	50-100	130.1	026.1
	150-600	131.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.062.1			230 76.83.37.101.1
813	76.80.60.064.1			255 76.83.37.102.1
1219	76.80.60.066.1			305 76.83.37.103.1
1524	76.80.60.068.1			355 76.83.37.105.1
1829	76.80.60.070.1			405 76.83.37.106.1
2134	76.80.60.072.1			455 76.83.37.107.1
2438	76.80.60.074.1			
2743	76.80.60.076.1			
3048	76.80.60.078.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.26.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.26.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.654.1

* DRAIN POINT DN 20 FIG.0H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.20.26.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.26.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.62.78.652.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.26.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.20.26.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.20.26.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.108.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.30.26.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.62.78.652.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.26.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.62.78.654.1

* VENT POINT DN 20 FIG.1H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.11.112.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.30.26.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 31091

DESIGN LIMITS			
TEMPERATURE IN DEGREES CELSIUS			
	0	50	65

	PRESSURE BAR GA		
DN25 -50	50.0	49.0	48.4
DN80 -100	42.0	42.0	42.0
DN150-150	31.0	31.0	31.0
DN200-300	21.0	21.0	21.0
NOTES			

- DESIGN LIMITS ACC.TO BS5351 BALL VALVE RATING			
- THIS PIPING CLASS IS ORIGINALLY DESIGNED FOR ACID SERVICE			
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.			
- STANDARD LONG RADIUS ELBOWS DN80 AND LARGER SHALL BE USED			
FOR SWEEP-IN CONNECTIONS.			
- DN15-20 PIPING COMPONENTS ONLY TO BE USED FOR SHORT BRANCHES			
E.G. PRESSURE POINTS			

BRANCH CONNECTIONS 90 DEGREES										TABLE OF SCHEDULES	
BRANCHSIZE										DN	SCHEDULE
RUN SIZE	40		80		150		250		300		
25	50	100	200	300							

300	C	C	X	X	X	X	X	X	X	15	160
250	C	C	X	X	X	X	X	X	X	20	160
200	C	C	X	X	X	X	X			25	160
150	C	C	X	X	X	X				40	160
100	C	C	X	X	X					50	80
80	C	C	X	X						80	80
50	C	B	A							100	80
40	B	A								150	80
25	A									200	80
										250	80
										300	80
CODE	EXPLANATION OF CHARACTERS										

A	EQUAL TEE										
B	REDUCING TEE										
C	BRANCH FITTING										
X	PIPE TO PIPE CONNECTION TO BE MADE BY SWEEP-IN OR LATERAL BRANCH										

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL	PLANT	:	
CLASS NO. : 31091	CONSIGNEE	:	
ANS RATING : CLASS 300	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A105

* FITTINGS

E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A234-WPB

* VALVES

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: ALLOY 20,PTFE
CHVF	CHECK VALVE FLANGED	DN 25-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: ALLOY 20
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: ALLOY 20

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 15-300	PTFE REINF.WITH MINERAL FILLER
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWGS	THERMOWELL STRAIGHT	DN 40- 40	ALLOY 20 (UNS N08020)

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE										
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE												
PIPE	74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	255.1	295.1	341.1
* FLANGES												
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1
WELDING NECK FLANGE	76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	618.1	620.1	622.1
* FITTINGS												
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1
* VALVES												
BALL VALVE FULL BORE FLANGED	77.00.60	653.1	654.1	655.1	657.1	658.1	660.1	662.1	664.1	665.1		
	77.00.61										666.1	667.1
CHECK VALVE FLANGED	77.10.50			055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GLOBE VALVE FLANGED	77.30.50	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
* MISCELLANEOUS												
GASKET, RAISED FACE	85.48.74	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1

		RECB	REEB
		76.	76.
RUN*	BR	-----	
20*	15	30.72.141.1	30.73.141.1
25*	20	30.72.161.1	30.73.161.1
40*	25	30.72.191.1	30.73.191.1
50*	40	30.72.208.1	30.73.208.1
80*	50	30.72.237.1	30.73.237.1
100*	80	30.72.277.1	30.73.277.1
150*	100	30.72.307.1	30.73.307.1
200*	150	30.72.337.1	30.73.337.1
250*	200	30.72.368.1	30.73.368.1
300*	250	30.72.408.1	30.73.408.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-300	121.1	016.1
20	40-300	123.1	018.1
25	40-100	125.1	020.1
40	150-300	126.1	024.1
	50-100	130.1	026.1
	150-300	131.1	028.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.161.1
255	76.83.37.162.1
305	76.83.37.163.1
355	76.83.37.165.1
405	76.83.37.166.1
455	76.83.37.167.1

BOLTING
 BOLTSET FLANGED JOINTS BOLTSET SPECTACLE/SPACER

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81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	80
20	4	5/8	*	80	20	4	5/8	*	90
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90	50	8	5/8	*	100
80	8	3/4	*	110	80	8	3/4	*	120
100	8	3/4	*	120	100	8	3/4	*	130
150	12	3/4	*	130	150	12	3/4	*	150
200	12	7/8	*	140	200	12	7/8	*	170
250	16	1	*	160	250	16	1	*	190
300	16	1 1/8	*	170	300	16	1 1/8	*	210

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CLASS 31125

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
AND LIMITED BY BS5351 BALL VALVE RATING
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	D	E	E	E	E	E	A					50	40
300	C	C	C	C	E	E	E	E	E	E	A						80	40
250	C	C	C	C	D	D	D	D	A								100	40
200	C	C	C	C	D	D	D	D	A								150	40
150	C	C	C	C	D	D	D	D	A								200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	30
40	C	B	B	A													400	30
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 31125		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY :		
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO. :		
REV. DATE : 12/96		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	469.1	521.1	569.1
PIPE NIPPLE 50MM		76.30.54	031.1	041.1	051.1	071.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.37	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1						
CHECK VALVE BUTT-WELD ENDS		77.11.14	053.1	054.1	055.1	057.1												
CHECK VALVE FLANGED		77.10.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.04								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED		77.30.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.22					052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1			

BROB				RECB				REEB				TERB				BROB				RECB				REEB				TERB				BNIF				BNIP					
76.				76.				76.				76.				76.				76.				76.				76.80.37				76.80.31									
RUN* BR																								BRANCH				RUN-PIPE													
20*	15			30.66.137.1	30.67.137.1	30.88.035.1	400*	50	79.00.370.1																						15	40-150	101.1	001.1							
25*	15			30.66.147.1	30.67.147.1	30.88.045.1	400*	80	79.00.382.1																									200-600	102.1	002.1					
25*	20			30.66.157.1	30.67.157.1	30.88.055.1	400*	100	79.00.394.1																						20	40- 80	103.1	003.1							
40*	15			30.66.167.1	30.67.167.1	30.88.065.1	400*	150	79.00.404.1	29.47.752.1	29.62.752.1	30.88.468.1																						100-600	104.1	004.1					
40*	20			30.66.177.1	30.67.177.1	30.88.075.1	400*	200	79.00.464.1	30.66.452.1	30.67.452.1	30.88.478.1																						25	40- 40	105.1	005.1				
40*	25			30.66.187.1	30.67.187.1	30.88.085.1	400*	250	79.00.480.1	30.66.461.1	30.67.461.1	30.88.504.1																								50- 50	106.1	006.1			
50*	20			30.66.192.1	30.67.192.1	30.88.100.1	400*	300	79.00.494.1	30.66.473.1	30.67.473.1	30.88.530.1																								80-100	107.1	007.1			
50*	25			30.66.196.1	30.67.196.1	30.88.109.1	400*	350	79.00.506.1	30.66.484.1	30.67.484.1	30.88.555.1																								150-600	108.1	008.1			
50*	40			30.66.206.1	30.67.206.1	30.88.118.1	450*	50	79.00.279.1																											40	50- 50	110.1	009.1		
80*	40			30.66.226.1	30.67.226.1	30.88.127.1	450*	80	79.00.291.1																												80- 80	111.1	010.1		
80*	50	79.00.810.1		30.66.235.1	30.67.235.1	30.88.132.1	450*	100	79.00.303.1																													100-100	112.1	011.1	
100*	40			30.66.250.1	30.67.250.1	30.88.145.1	450*	150	79.00.313.1																													150-300	113.1	013.1	
100*	50	79.00.812.1		30.66.265.1	30.67.265.1	30.88.153.1	450*	200	79.00.109.1	30.66.509.1	30.67.509.1	30.88.586.1																										350-600	114.1	014.1	
100*	80	79.00.836.1		30.66.275.1	30.67.275.1	30.88.165.1	450*	250	79.00.116.1	30.66.532.1	30.67.532.1	30.88.610.1																													
150*	50	79.00.814.1					450*	300	79.00.122.1	30.66.562.1	30.67.562.1	30.88.634.1																													
150*	80	79.00.838.1		30.66.295.1	30.67.295.1	30.88.177.1	450*	350	79.00.127.1	30.66.594.1	30.67.594.1	30.88.658.1																													
150*	100	79.00.860.1		30.66.305.1	30.67.305.1	30.88.189.1	450*	400	79.00.131.1	30.66.624.1	30.67.624.1	30.88.682.1																													
200*	50	79.00.366.1					500*	50	79.00.280.1																																
200*	80	79.00.378.1					500*	80	79.00.292.1																																
200*	100	79.00.390.1		30.66.324.1	30.67.324.1	30.88.211.1	500*	100	79.00.304.1																																
200*	150	79.00.400.1		30.66.334.1	30.67.334.1	30.88.231.1	500*	150	79.00.314.1																																
250*	50	79.00.367.1					500*	200	79.00.110.1	29.47.909.1	29.62.909.1	30.88.706.1																													
250*	80	79.00.379.1					500*	250	79.00.117.1	30.66.639.1	30.67.639.1	30.88.730.1																													
250*	100	79.00.391.1					500*	300	79.00.123.1	30.66.652.1	30.67.652.1	30.88.754.1																													
250*	150	79.00.401.1		30.66.352.1	30.67.352.1	30.88.277.1	500*	350	79.00.128.1	30.66.684.1	30.67.684.1	30.88.778.1																													
250*	200	79.00.458.1		30.66.363.1	30.67.363.1	30.88.290.1	500*	400	79.00.132.1	30.66.714.1	30.67.714.1	30.88.802.1																													
300*	50	79.00.368.1					500*	450	79.00.250.1	30.66.731.1	30.67.731.1	30.88.818.1																													
300*	80	79.00.380.1					600*	50	79.00.282.1																																
300*	100	79.00.392.1					600*	80	79.00.294.1																																
300*	150	79.00.402.1		30.66.381.1	30.67.381.1	30.88.316.1	600*	100	79.00.306.1																																
300*	200	79.00.460.1		30.66.394.1	30.67.394.1	30.88.327.1	600*	150	79.00.316.1																																
300*	250	79.00.476.1		30.66.403.1	30.67.403.1	30.88.349.1	600*	200	79.00.111.1																																
350*	50	79.00.369.1					600*	250	79.00.118.1	30.66.809.1	30.67.809.1	30.88.850.1																													
350*	80	79.00.381.1					600*	300	79.00.124.1	30.66.829.1	30.67.829.1	30.88.874.1																													
350*	100	79.00.393.1					600*	350	79.00.129.1	30.66.849.1	30.67.849.1	30.88.898.1																													
350*	150	79.00.403.1		30.66.412.1	30.67.412.1	30.88.378.1	600*	400	79.00.133.1	30.66.894.1	30.67.894.1	30.88.922.1																													
350*	200	79.00.462.1		30.66.421.1	30.67.421.1	30.88.389.1	600*	450	79.00.254.1	30.66.911.1	30.67.911.1	30.88.938.1																													
350*	250	79.00.478.1		30.66.433.1	30.67.433.1	30.88.414.1	600*	500	79.00.260.1	30.66.941.1	30.67.941.1	30.88.962.1																													
350*	300	79.00.492.1		30.66.443.1	30.67.443.1	30.88.440.1																																			

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.422.1	230	76.83.37.101.1
813	76.80.60.424.1	255	76.83.37.102.1
1219	76.80.60.426.1	305	76.83.37.103.1
1524	76.80.60.428.1	355	76.83.37.105.1
1829	76.80.60.430.1	405	76.83.37.106.1
2134	76.80.60.432.1	455	76.83.37.107.1
2438	76.80.60.434.1		
2743	76.80.60.436.1		
3048	76.80.60.438.1		

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	* 70	66.155.1	15	4	1/2	* 70	66.155.1
20	4	5/8	* 80	66.269.1	20	4	5/8	* 80	66.269.1
25	4	5/8	* 80	66.269.1	25	4	5/8	* 90	66.271.1
40	4	3/4	* 90	66.327.1	40	4	3/4	* 100	66.329.1
50	8	5/8	* 90	66.271.1					
80	8	3/4	* 110	66.330.1					
100	8	3/4	* 120	66.332.1					
150	12	3/4	* 130	66.334.1					
200	12	7/8	* 140	66.404.1					
250	16	1	* 160	66.472.1					
300	16	1 1/8	* 170	66.532.1					
350	20	1 1/8	* 180	66.533.1					
400	20	1 1/4	* 190	66.592.1					
450	24	1 1/4	* 200	66.588.1					
500	24	1 1/4	* 210	66.595.1					
600	24	1 1/2	* 240	66.687.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	80	66.157.1	
					20	4	5/8	*	90	66.271.1	
					25	4	5/8	*	90	66.271.1	
					40	4	3/4	*	100	66.329.1	
50	8	5/8	*	150	66.281.1	50	8	5/8	*	100	66.273.1
80	8	3/4	*	150	66.337.1	80	8	3/4	*	120	66.332.1
100	12	3/4	*	140	66.335.1	100	8	3/4	*	130	66.334.1
150	12	3/4	*	140	66.335.1	150	12	3/4	*	150	66.337.1
200	12	7/8	*	150	66.406.1	200	12	7/8	*	170	66.409.1
250	16	1	*	170	66.474.1	250	16	1	*	190	66.477.1
300	16	1 1/8	*	190	66.535.1	300	16	1 1/8	*	210	66.538.1
350	20	1 1/8	*	200	66.525.1	350	20	1 1/8	*	220	66.540.1
400	20	1 1/4	*	210	66.595.1	400	20	1 1/4	*	240	66.600.1
450	24	1 1/4	*	220	66.597.1	450	24	1 1/4	*	250	66.609.1
500	24	1 1/4	*	230	66.598.1	500	24	1 1/4	*	260	66.603.1
600	24	1 1/2	*	260	66.690.1	600	24	1 1/2	*	300	66.696.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.103.1	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.104.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.66.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.104.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.66.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
	8	81.38.66.155.1	
WELDING NECK FLANGE	2	76.62.78.602.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.03.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
	4	81.38.66.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.03.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.66.155.1	
	8	81.38.66.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.053.1	
STUD BOLT WITH NUTS	4	81.38.66.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* VENT POINT	DN 20	FIG.1M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	1	85.30.01.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.054.1	
STUD BOLT WITH NUTS	4	81.38.66.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

CLASS 31126

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
AND LIMITED BY BS5351 BALL VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50	80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80	80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100	80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150	80
150	C	C	C	C	D	D	D	D	A								200	40
100	C	C	C	C	D	D	D	A									250	40
80	C	C	C	C	D	D	A										300	40
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 31126		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY :		
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO. :		
REV. DATE : 12/96		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	431.1	483.1	533.1	583.1
PIPE NIPPLE	50MM	76.30.54	036.1	046.1	056.1	076.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.37	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1						
CHECK VALVE FLANGED		77.10.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.04								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
STRAINER Y-TYPE		76.83.22					076.1	078.1	080.1	082.1	084.1	086.1	088.1	090.1	092.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.01.074.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.01.098.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.01.120.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.01.140.1	29.47.754.1	29.62.754.1	30.88.469.1
40* 20		30.66.181.1	30.67.181.1		400*200	79.00.908.1	30.66.453.1	30.67.453.1	30.88.479.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250	79.00.924.1	30.66.462.1	30.67.462.1	30.88.505.1
50* 20		30.66.193.1	30.67.193.1	30.88.102.1	400*300	79.00.938.1	30.66.474.1	30.67.474.1	30.88.531.1
50* 25		30.66.199.1	30.67.199.1	30.88.111.1	400*350	79.00.950.1	30.66.487.1	30.67.487.1	30.88.556.1
50* 40		30.66.208.1	30.67.208.1	30.88.120.1	450* 50	79.01.076.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450* 80	79.01.100.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*100	79.01.122.1			
100* 40		30.66.253.1	30.67.253.1	30.88.147.1	450*150	79.01.142.1			
100* 50	79.01.362.1	30.66.267.1	30.67.267.1	30.88.154.1	450*200	79.00.910.1	30.66.503.1	30.67.503.1	30.88.580.1
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1	450*250	79.00.926.1	30.66.523.1	30.67.523.1	30.88.604.1
150* 50	79.01.364.1				450*300	79.00.940.1	30.66.553.1	30.67.553.1	30.88.628.1
150* 80	79.01.388.1	30.66.297.1	30.67.297.1	30.88.178.1	450*350	79.00.952.1	30.66.584.1	30.67.584.1	30.88.652.1
150*100	79.01.410.1	30.66.307.1	30.67.307.1	30.88.190.1	450*400	79.00.962.1	30.66.614.1	30.67.614.1	30.88.676.1
200* 50	79.01.066.1				500* 50	79.01.078.1			
200* 80	79.01.090.1				500* 80	79.01.102.1			
200*100	79.01.112.1	30.66.326.1	30.67.326.1	30.88.212.1	500*100	79.01.124.1			
200*150	79.01.132.1	30.66.336.1	30.67.336.1	30.88.232.1	500*150	79.01.144.1			
250* 50	79.01.068.1				500*200	79.00.912.1	29.47.902.1	29.62.902.1	30.88.700.1
250* 80	79.01.092.1				500*250	79.00.928.1	30.66.635.1	30.67.635.1	30.88.724.1
250*100	79.01.114.1	29.47.344.1	29.62.344.1	30.88.260.1	500*300	79.00.942.1	30.66.643.1	30.67.643.1	30.88.748.1
250*150	79.01.134.1	30.66.356.1	30.67.356.1	30.88.278.1	500*350	79.00.954.1	30.66.674.1	30.67.674.1	30.88.772.1
250*200	79.00.902.1	30.66.365.1	30.67.365.1	30.88.291.1	500*400	79.00.964.1	30.66.704.1	30.67.704.1	30.88.796.1
300* 50	79.01.070.1				500*450	79.00.972.1	30.66.734.1	30.67.734.1	30.88.820.1
300* 80	79.01.094.1				600* 50	79.01.082.1			
300*100	79.01.116.1				600* 80	79.01.106.1			
300*150	79.01.136.1	30.66.380.1	30.67.380.1	30.88.317.1	600*100	79.01.128.1			
300*200	79.00.904.1	30.66.396.1	30.67.396.1	30.88.328.1	600*150	79.01.148.1			
300*250	79.00.920.1	30.66.404.1	30.67.404.1	30.88.350.1	600*200	79.00.916.1			
350* 50	79.01.072.1				600*250	79.00.932.1	30.66.803.1	30.67.803.1	30.88.844.1
350* 80	79.01.096.1				600*300	79.00.946.1	30.66.823.1	30.67.823.1	30.88.868.1
350*100	79.01.118.1				600*350	79.00.958.1	30.66.843.1	30.67.843.1	30.88.892.1
350*150	79.01.138.1	29.47.604.1	29.62.604.1	30.88.379.1	600*400	79.00.968.1	30.66.884.1	30.67.884.1	30.88.916.1
350*200	79.00.906.1	30.66.422.1	30.67.422.1	30.88.390.1	600*450	79.00.976.1	30.66.914.1	30.67.914.1	30.88.940.1
350*250	79.00.922.1	30.66.438.1	30.67.438.1	30.88.415.1	600*500	79.00.982.1	30.66.944.1	30.67.944.1	30.88.964.1
350*300	79.00.936.1	30.66.447.1	30.67.447.1	30.88.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	121.1	016.1
20	40-600	123.1	018.1
25	40-100	125.1	020.1
	150-600	126.1	024.1
40	50-100	130.1	026.1
	150-600	131.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.422.1			230 76.83.37.101.1
813	76.80.60.424.1			255 76.83.37.102.1
1219	76.80.60.426.1			305 76.83.37.103.1
1524	76.80.60.428.1			355 76.83.37.105.1
1829	76.80.60.430.1			405 76.83.37.106.1
2134	76.80.60.432.1			455 76.83.37.107.1
2438	76.80.60.434.1			
2743	76.80.60.436.1			
3048	76.80.60.438.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT			DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.103.1	
BLIND FLANGE			1	76.62.11.108.1	
GASKET, RF TANGED INSERT			2	85.30.01.104.1	
STUD BOLT WITH NUTS			8	81.38.66.155.1	
WELDING NECK FLANGE			1	76.62.78.652.1	

* DRAIN POINT			DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.104.1	
BLIND FLANGE			1	76.62.11.112.1	
GASKET, RF TANGED INSERT			2	85.30.01.106.1	
STUD BOLT WITH NUTS			8	81.38.66.269.1	
WELDING NECK FLANGE			1	76.62.78.654.1	

* DRAIN POINT			DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.104.1	
BLIND FLANGE			1	76.62.11.112.1	
GASKET, RF TANGED INSERT			2	85.30.01.106.1	
STUD BOLT WITH NUTS			8	81.38.66.269.1	

* ORIFICE INSTR.CONN.			DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			2	77.00.03.103.1	
GASKET, RF TANGED INSERT			4	85.30.01.104.1	
LAP-JOINT FLANGE			2	76.62.20.308.1	
STUD BOLT WITH NUTS			8	81.38.66.155.1	
WELDING NECK FLANGE			2	76.62.78.652.1	

* PRESSURE INSTR.CONN.			DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.103.1	
GASKET, RF TANGED INSERT			2	85.30.01.104.1	
LAP-JOINT FLANGE			1	76.62.20.308.1	
STUD BOLT WITH NUTS			4	81.38.66.155.1	
WELDING NECK FLANGE			4	81.38.66.155.1	
			1	76.62.78.652.1	

* PRESSURE INSTR.CONN.			DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.103.1	
GASKET, RF TANGED INSERT			2	85.30.01.104.1	
LAP-JOINT FLANGE			1	76.62.20.308.1	
STUD BOLT WITH NUTS			4	81.38.66.155.1	
			4	81.38.66.155.1	

* METERRUN INSTR. CONN			DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			2	77.00.03.103.1	
GASKET, RF TANGED INSERT			4	85.30.01.104.1	
LAP-JOINT FLANGE			2	76.62.20.308.1	
STUD BOLT WITH NUTS			8	81.38.66.155.1	
			8	81.38.66.155.1	

* TEMPERATURE INSTR.C.			DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE			1	76.62.60.533.1	
GASKET, RF TANGED INSERT			1	85.30.01.112.1	
STUD BOLT WITH NUTS			4	81.38.66.330.1	
THERMOWELL STRAIGHT			L=230 MM	1	76.83.37.101.1

* TEMPERATURE INSTR.C.			DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE			1	76.62.60.533.1	
GASKET, RF TANGED INSERT			1	85.30.01.112.1	
STUD BOLT WITH NUTS			4	81.38.66.330.1	
THERMOWELL STRAIGHT			L=255 MM	1	76.83.37.102.1

* VENT POINT			DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.108.1	
GASKET, RF TANGED INSERT			2	85.30.01.104.1	
GLOBE VALVE FLANGED			1	77.30.05.053.1	
STUD BOLT WITH NUTS			8	81.38.66.155.1	
WELDING NECK FLANGE			1	76.62.78.652.1	

* VENT POINT			DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.112.1	
GASKET, RF TANGED INSERT			2	85.30.01.106.1	
GLOBE VALVE FLANGED			1	77.30.05.054.1	
STUD BOLT WITH NUTS			8	81.38.66.269.1	
WELDING NECK FLANGE			1	76.62.78.654.1	

* VENT POINT			DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.112.1	
GASKET, RF TANGED INSERT			2	85.30.01.106.1	
GLOBE VALVE FLANGED			1	77.30.05.054.1	
STUD BOLT WITH NUTS			8	81.38.66.269.1	

CLASS 31131

DESIGN LIMITS								
TEMPERATURE IN DEGREES CELSIUS								
	0	50	75	100	125	150	175	200

	PRESSURE BAR GA							
DN15 -80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES																TABLE OF SCHEDULES		
BRANCHSIZE																DN	SCHEDULE	
RUN SIZE	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600			
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	D	E	E	E	E	E	A					50	40
300	C	C	C	C	E	E	E	E	E	E	A						80	40
250	C	C	C	C	D	D	D	D	D	A							100	40
200	C	C	C	C	D	D	D	D	D	A							150	40
150	C	C	C	C	D	D	D	D	A								200	30
100	C	C	C	C	D	D	D	D	A								250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	30
40	C	B	B	A													400	30
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 31131	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31131, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	469.1	521.1	569.1
PIPE NIPPLE	50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE		76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.06	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1						
CHECK VALVE FLANGED		77.10.26	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.26								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.26	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET		76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.19					452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1			

BROB				RECB				REEB				TERB				BROB				RECB				REEB				TERB				BNIF				BNIP																			
76.				76.				76.				76.				76.				76.				76.				76.				76.80.37				76.80.31																			
RUN* BR																												BRANCH				RUN-PIPE																							
20* 15				30.72.137.1				30.73.137.1				30.89.035.1				400* 50				79.00.370.1																15				40-150				101.1				001.1							
25* 15				30.72.147.1				30.73.147.1				30.89.045.1				400* 80				79.00.382.1																				200-600				102.1				002.1							
25* 20				30.72.157.1				30.73.157.1				30.89.055.1				400*100				79.00.394.1																20				40- 80				103.1				003.1							
40* 15				30.72.167.1				30.73.167.1				30.89.065.1				400*150				79.00.404.1				29.46.752.1				29.61.752.1												100-600				104.1				004.1							
40* 20				30.72.177.1				30.73.177.1				30.89.075.1				400*200				79.00.464.1				30.72.452.1				30.73.452.1				30.89.478.1								25				40- 40				105.1				005.1			
40* 25				30.72.187.1				30.73.187.1				30.89.085.1				400*250				79.00.480.1				30.72.461.1				30.73.461.1				30.89.504.1								50- 50				106.1				006.1							
50* 20				29.46.192.1				29.61.192.1				30.89.100.1				400*300				79.00.494.1				30.72.473.1				30.73.473.1				30.89.530.1								80-100				107.1				007.1							
50* 25				30.72.196.1				30.73.196.1				30.89.109.1				400*350				79.00.506.1				30.72.484.1				30.73.484.1				30.89.555.1								150-600				108.1				008.1							
50* 40				30.72.206.1				30.73.206.1				30.89.118.1				450* 50				79.00.279.1																40				50- 50				110.1				009.1							
80* 40				30.72.226.1				30.73.226.1				30.89.127.1				450* 80				79.00.291.1																				80- 80				111.1				010.1							
80* 50				79.00.810.1				30.72.235.1				30.73.235.1				30.89.132.1				450*100				79.00.303.1																100-100				112.1				011.1							
100* 40								30.72.250.1				30.73.250.1				30.89.145.1				450*150				79.00.313.1																150-300				113.1				013.1							
100* 50				79.00.812.1				30.72.265.1				30.73.265.1				30.89.153.1				450*200				79.00.109.1				30.72.509.1				30.73.509.1								350-600				114.1				014.1							
100* 80				79.00.836.1				30.72.275.1				30.73.275.1				30.89.165.1				450*250				79.00.116.1				30.72.532.1				30.73.532.1																							
150* 50				79.00.814.1												450*300				79.00.122.1				30.72.562.1				30.73.562.1																											
150* 80				79.00.838.1				30.72.295.1				30.73.295.1				30.89.177.1				450*350				79.00.127.1				30.72.594.1				30.73.594.1																							
150*100				79.00.860.1				30.72.305.1				30.73.305.1				30.89.189.1				450*400				79.00.131.1				30.72.624.1				30.73.624.1																							
200* 50				79.00.366.1												500* 50				79.00.280.1																																			
200* 80				79.00.378.1												500* 80				79.00.292.1																																			
200*100				79.00.390.1				30.72.324.1				30.73.324.1				30.89.211.1				500*100				79.00.304.1																															
200*150				79.00.400.1				30.72.334.1				30.73.334.1				30.89.231.1				500*150				79.00.314.1																															
250* 50				79.00.367.1												500*200				79.00.110.1				29.46.909.1				29.61.909.1												LEVEL				DISPLACER				CHAMBER				THERMOW			
250* 80				79.00.379.1												500*250				79.00.117.1				30.72.639.1				30.73.639.1												LENGTH				MESCNUMBER				LENGTH							
250*100				79.00.391.1				29.46.342.1				29.61.342.1				30.89.259.1				500*300				79.00.123.1				30.72.652.1				30.73.652.1																							
250*150				79.00.401.1				30.72.352.1				30.73.352.1				30.89.277.1				500*350				79.00.128.1				30.72.684.1				30.73.684.1				356				76.80.60.062.1				230											
250*200				79.00.458.1				30.72.363.1				30.73.363.1				30.89.290.1				500*400				79.00.132.1				30.72.714.1				30.73.714.1				813				76.80.60.064.1				255											
300* 50				79.00.368.1												500*450				79.00.250.1				30.72.731.1				30.73.731.1				30.89.818.1								1219				76.80.60.066.1				305							
300* 80				79.00.380.1												600* 50				79.00.282.1																				1524				76.80.60.068.1				355							
300*100				79.00.392.1												600* 80				79.00.294.1																				1829				76.80.60.070.1				405							
300*150				79.00.402.1				30.72.381.1				30.73.381.1				30.89.316.1				600*100				79.00.306.1																2134				76.80.60.072.1				455							
300*200				79.00.460.1				30.72.394.1				30.73.394.1				30.89.327.1				600*150				79.00.316.1																2438				76.80.60.074.1											
300*250				79.00.476.1				30.72.403.1				30.73.403.1				30.89.349.1				600*200				79.00.111.1																2743				76.80.60.076.1											
350* 50				79.00.369.1												600*250				79.00.118.1				30.72.809.1				30.73.809.1												3048				76.80.60.078.1											
350* 80				79.00.381.1												600*300				79.00.124.1				30.72.829.1				30.73.829.1																											
350*100				79.00.393.1												600*350				79.00.129.1				30.72.849.1				30.73.849.1																											
350*150				79.00.403.1				30.72.412.1				30.73.412.1				30.89.378.1				600*400				79.00.133.1				30.72.894.1				30.73.894.1																							
350*200				79.00.462.1				30.72.421.1				30.73.421.1				30.89.389.1				600*450				79.00.254.1				30.72.911.1				30.73.911.1				30.89.938.1																			
350*250				79.00.478.1				30.72.433.1				30.73.433.1				30.89.414.1				600*500				79.00.260.1				30.72.941.1				30.73.941.1				30.89.962.1																			
350*300				79.00.492.1				30.72.443.1				30.73.443.1				30.89.440.1																																							

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

LEVEL	DISPLACER	CHAMBER	THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.062.1		230	76.83.37.101.1
813	76.80.60.064.1		255	76.83.37.102.1
1219	76.80.60.066.1		305	76.83.37.103.1
1524	76.80.60.068.1		355	76.83.37.105.1
1829	76.80.60.070.1		405	76.83.37.106.1
2134	76.80.60.072.1		455	76.83.37.107.1
2438	76.80.60.074.1			
2743	76.80.60.076.1			
3048	76.80.60.078.1			

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.06.103.1	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.06.104.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.06.104.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.06.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.602.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.06.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.06.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.06.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.30.26.053.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.26.054.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.26.054.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	

CLASS 31160

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400

PRESSURE BAR GA									
DN15 -600	50.5	50.0	46.3	45.1	43.8	41.8	38.8	36.8	32.6

- NOTES
-
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 40
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 40
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 40
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 40
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 30
40	C	B	B	A													400 30
25	B	B	A														450 30
20	B	A															500 30
15	A																600 30

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 31160	CONSIGNEE	:	
ANS RATING : CLASS 300	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : O	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 31160, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GABB	GATE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVB	GLOBE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 50-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	DN902-920	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE	76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE	76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	236.1	257.1	278.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
* VALVES																	
CHECK VALVE BUTT-WELD ENDS	77.11.21	053.1	054.1	055.1	057.1												
CHECK VALVE FLANGED	77.10.20					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE BW BELLOWS SEALED	77.21.21	753.1	754.1	755.1	757.1												
GATE VALVE FLANGED	77.20.17	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE BW BELLOWS SEALED	77.31.21	753.1	754.1	755.1	757.1												
GLOBE VALVE FLANGED	77.30.19					058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.41.46	404.1	406.1	408.1	412.1	414.1	418.1	370.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1	388.1	392.1
METER RUN	76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
STRAINER Y-TYPE	76.83.19					452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.370.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.382.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.394.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.404.1	29.46.752.1	29.61.752.1	
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.464.1	30.72.452.1	30.73.452.1	30.89.478.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.480.1	30.72.461.1	30.73.461.1	30.89.504.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.494.1	30.72.473.1	30.73.473.1	30.89.530.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.506.1	30.72.484.1	30.73.484.1	30.89.555.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.371.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.383.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.395.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.405.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.466.1	30.72.502.1	30.73.502.1	30.89.579.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.482.1	30.72.521.1	30.73.521.1	30.89.603.1
150* 50	79.00.814.1				450*300	79.00.496.1	30.72.551.1	30.73.551.1	30.89.627.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.508.1	30.72.582.1	30.73.582.1	30.89.651.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.518.1	30.72.612.1	30.73.612.1	30.89.675.1
200* 50	79.00.366.1				500* 50	79.00.372.1			
200* 80	79.00.378.1				500* 80	79.00.384.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.396.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.406.1			
250* 50	79.00.367.1				500*200	79.00.468.1	29.46.901.1	29.61.901.1	30.89.699.1
250* 80	79.00.379.1				500*250	79.00.484.1	30.72.634.1	30.73.634.1	30.89.723.1
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.498.1	30.72.641.1	30.73.641.1	30.89.747.1
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.510.1	30.72.672.1	30.73.672.1	30.89.771.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.520.1	30.72.702.1	30.73.702.1	30.89.795.1
300* 50	79.00.368.1				500*450	79.00.528.1	30.72.732.1	30.73.732.1	30.89.819.1
300* 80	79.00.380.1				600* 50	79.00.374.1			
300*100	79.00.392.1				600* 80	79.00.386.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.398.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.408.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.472.1			
350* 50	79.00.369.1				600*250	79.00.488.1	30.72.802.1	30.73.802.1	30.89.843.1
350* 80	79.00.381.1				600*300	79.00.502.1	30.72.822.1	30.73.822.1	30.89.867.1
350*100	79.00.393.1				600*350	79.00.514.1	30.72.842.1	30.73.842.1	30.89.891.1
350*150	79.00.403.1	30.72.412.1	30.73.412.1	30.89.378.1	600*400	79.00.524.1	30.72.882.1	30.73.882.1	30.89.915.1
350*200	79.00.462.1	30.72.421.1	30.73.421.1	30.89.389.1	600*450	79.00.532.1	30.72.912.1	30.73.912.1	30.89.939.1
350*250	79.00.478.1	30.72.433.1	30.73.433.1	30.89.414.1	600*500	79.00.538.1	30.72.942.1	30.73.942.1	30.89.963.1
350*300	79.00.492.1	30.72.443.1	30.73.443.1	30.89.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	101.1	001.1
	200-600	102.1	002.1
20	40- 80	103.1	003.1
	100-600	104.1	004.1
25	40- 40	105.1	005.1
	50- 50	106.1	006.1
	80-100	107.1	007.1
	150-600	108.1	008.1
40	50- 50	110.1	009.1
	80- 80	111.1	010.1
	100-100	112.1	011.1
	150-300	113.1	013.1
	350-600	114.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.062.1		230	76.83.37.101.1
813	76.80.60.064.1		255	76.83.37.102.1
1219	76.80.60.066.1		305	76.83.37.103.1
1524	76.80.60.068.1		355	76.83.37.105.1
1829	76.80.60.070.1		405	76.83.37.106.1
2134	76.80.60.072.1		455	76.83.37.107.1
2438	76.80.60.074.1			
2743	76.80.60.076.1			
3048	76.80.60.078.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	80
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.0M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
BLIND FLANGE		1	76.62.11.108.1	
GASKET, SPIRAL WOUND		1	85.41.46.404.1	
GATE VALVE BW BELLOWS SEALED		1	77.21.21.753.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
WELDING NECK FLANGE		1	76.62.78.602.1	

* DRAIN POINT		DN 20	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
BLIND FLANGE		1	76.62.11.112.1	
GASKET, SPIRAL WOUND		1	85.41.46.406.1	
GATE VALVE BW BELLOWS SEALED		1	77.21.21.754.1	
STUD BOLT WITH NUTS		4	81.38.61.269.1	
WELDING NECK FLANGE		1	76.62.78.604.1	

* ORIFICE INSTR.CONN.		DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
GASKET, SPIRAL WOUND		2	85.41.46.404.1	
GATE VALVE BW BELLOWS SEALED		2	77.21.21.753.1	
LAP-JOINT FLANGE		2	76.62.20.308.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
WELDING NECK FLANGE		2	76.62.78.602.1	

* PRESSURE INSTR.CONN.		DN 15	FIG.0M	DN 15 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
GASKET, SPIRAL WOUND		1	85.41.46.404.1	
GATE VALVE BW BELLOWS SEALED		1	77.21.21.753.1	
LAP-JOINT FLANGE		1	76.62.20.308.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
WELDING NECK FLANGE		1	76.62.78.602.1	

* METERRUN INSTR. CONN		DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
GASKET, SPIRAL WOUND		4	85.41.46.404.1	
GATE VALVE FLANGED		2	77.20.17.053.1	
LAP-JOINT FLANGE		2	76.62.20.308.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
		8	81.38.61.155.1	

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.533.1	
GASKET, SPIRAL WOUND		1	85.41.46.412.1	
STUD BOLT WITH NUTS		4	81.38.61.330.1	
THERMOWELL STRAIGHT L=230 MM		1	76.83.37.101.1	

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.533.1	
GASKET, SPIRAL WOUND		1	85.41.46.412.1	
STUD BOLT WITH NUTS		4	81.38.61.330.1	
THERMOWELL STRAIGHT L=255 MM		1	76.83.37.102.1	

* VENT POINT		DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
BLIND FLANGE		1	76.62.11.108.1	
GASKET, SPIRAL WOUND		1	85.41.46.404.1	
GLOBE VALVE BW BELLOWS SEALED		1	77.31.21.753.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
WELDING NECK FLANGE		1	76.62.78.602.1	

* VENT POINT		DN 20	FIG.1M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)
BLIND FLANGE		1	76.62.11.112.1	
GASKET, SPIRAL WOUND		1	85.41.46.406.1	
GLOBE VALVE BW BELLOWS SEALED		1	77.31.21.754.1	
STUD BOLT WITH NUTS		4	81.38.61.269.1	
WELDING NECK FLANGE		1	76.62.78.604.1	

CLASS 31172

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	-50	0	50	75	100	125	150	175	200
	PRESSURE BAR GA								
DN15 -80	47.9	47.9	47.3	46.0	45.0	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

NOTES

- -----
 - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3,
 AND LIMITED BY BS5351 BALL VALVE RATING
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	D	E	E	E	E	E	E	E	E	E	A	50 40
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 40
250	C	C	C	C	D	D	D	D	D	A							100 40
200	C	C	C	C	D	D	D	D	D	A							150 40
150	C	C	C	C	D	D	D	D	D	A							200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 30
40	C	B	B	A													400 30
25	B	B	A														450 20
20	B	A															500 20
15	A																600 20

CODE EXPLANATION OF CHARACTERS

 A EQUAL TEE
 B REDUCING TEE
 C BRANCH FITTING
 D PIPE TO PIPE
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	PLANT :	
CLASS NO. : 31172	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31172, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7/A194-4
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7/A194-4
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.17	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	093.1	105.1	117.1	130.1	140.1	164.1	204.1	234.1
PIPE NIPPLE	50MM	76.31.57	531.1	541.1	551.1	571.1												
* FLANGES																		
BLIND FLANGE		76.62.12	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1	534.1	536.1	538.1	540.1	542.1
SPECTACLE BLIND FLANGE		76.88.34	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1	284.1	286.1	288.1	290.1	294.1
SPACER RING TYPE (ASME FLANGE)		76.88.17	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
WELDING NECK FLANGE		76.62.82	802.1	804.1	808.1	810.1	760.1	762.1	764.1	766.1	708.1	710.1	712.1	714.1	716.1	678.1	680.1	684.1
* FITTINGS																		
CAP BUTT-WELD.END		76.31.18	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	384.1	394.1	404.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	384.1	394.1	404.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	384.1	394.1	404.1
EQUAL TEE BUTT-WELD ENDS		76.31.84	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	384.1	394.1	404.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.33	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1						
CHECK VALVE FLANGED		77.10.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.33								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	312.1	314.1	316.1	318.1												
ORIFICE FLANGE SET		76.62.97					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
STRAINER Y-TYPE		76.83.19					552.1	554.1	556.1	558.1	560.1	562.1	564.1	566.1	568.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		31.70.137.1	31.71.137.1	31.85.035.1	400* 50	79.04.370.1			
25* 15		31.70.147.1	31.71.147.1	31.85.045.1	400* 80	79.04.382.1			
25* 20		31.70.157.1	31.71.157.1	31.85.055.1	400*100	79.04.394.1			
40* 15		31.70.167.1	31.71.167.1	31.85.065.1	400*150	79.04.404.1	29.44.752.1	29.59.752.1	31.85.468.1
40* 20		31.70.177.1	31.71.177.1	31.85.075.1	400*200	79.04.464.1	31.70.452.1	31.71.452.1	31.85.478.1
40* 25		31.70.187.1	31.71.187.1	31.85.085.1	400*250	79.04.480.1	31.70.461.1	31.71.461.1	31.85.504.1
50* 20		29.44.192.1	29.59.192.1	31.85.100.1	400*300	79.04.494.1	31.70.473.1	31.71.473.1	31.85.530.1
50* 25		31.70.198.1	31.71.198.1	31.85.109.1	400*350	79.04.506.1	31.70.484.1	31.71.484.1	31.85.555.1
50* 40		31.70.206.1	31.71.206.1	31.85.118.1	450* 50	79.04.279.1			
80* 40		31.70.226.1	31.71.226.1	31.85.127.1	450* 80	79.04.291.1			
80* 50	79.04.810.1	31.70.235.1	31.71.235.1	31.85.132.1	450*100	79.04.303.1			
100* 40		31.70.250.1	31.71.250.1	31.85.145.1	450*150	79.04.313.1			
100* 50	79.04.812.1	31.70.265.1	31.71.265.1	31.85.153.1	450*200	79.04.109.1	31.70.509.1	31.71.509.1	31.85.586.1
100* 80	79.04.836.1	31.70.275.1	31.71.275.1	31.85.165.1	450*250	79.04.116.1	31.70.532.1	31.71.532.1	31.85.610.1
150* 50	79.04.814.1				450*300	79.04.122.1	31.70.562.1	31.71.562.1	31.85.634.1
150* 80	79.04.838.1	31.70.295.1	31.71.295.1	31.85.177.1	450*350	79.04.127.1	31.70.594.1	31.71.594.1	31.85.658.1
150*100	79.04.860.1	31.70.305.1	31.71.305.1	31.85.189.1	450*400	79.04.131.1	31.70.624.1	31.71.624.1	31.85.682.1
200* 50	79.04.366.1				500* 50	79.04.280.1			
200* 80	79.04.378.1				500* 80	79.04.292.1			
200*100	79.04.390.1	31.70.324.1	31.71.324.1	31.85.211.1	500*100	79.04.304.1			
200*150	79.04.400.1	31.70.334.1	31.71.334.1	31.85.231.1	500*150	79.04.314.1			
250* 50	79.04.367.1				500*200	79.04.110.1	29.44.909.1	29.59.909.1	31.85.706.1
250* 80	79.04.379.1				500*250	79.04.117.1	31.70.639.1	31.71.639.1	31.85.730.1
250*100	79.04.391.1	29.44.342.1	29.59.342.1	31.85.259.1	500*300	79.04.123.1	31.70.652.1	31.71.652.1	31.85.754.1
250*150	79.04.401.1	31.70.352.1	31.71.352.1	31.85.277.1	500*350	79.04.128.1	31.70.684.1	31.71.684.1	31.85.778.1
250*200	79.04.458.1	31.70.363.1	31.71.363.1	31.85.290.1	500*400	79.04.132.1	31.70.714.1	31.71.714.1	31.85.802.1
300* 50	79.04.368.1				500*450	79.04.250.1	31.70.731.1	31.71.731.1	31.85.818.1
300* 80	79.04.380.1				600* 50	79.04.282.1			
300*100	79.04.392.1				600* 80	79.04.294.1			
300*150	79.04.402.1	31.70.381.1	31.71.381.1	31.85.316.1	600*100	79.04.306.1			
300*200	79.04.460.1	31.70.394.1	31.71.394.1	31.85.327.1	600*150	79.04.316.1			
300*250	79.04.476.1	31.70.403.1	31.71.403.1	31.85.349.1	600*250	79.04.118.1	31.70.809.1	31.71.809.1	31.85.850.1
350* 50	79.04.369.1				600*300	79.04.124.1	31.70.829.1	31.71.829.1	31.85.874.1
350* 80	79.04.381.1				600*350	79.04.129.1	31.70.849.1	31.71.849.1	31.85.898.1
350*100	79.04.393.1				600*400	79.04.133.1	31.70.894.1	31.71.894.1	31.85.922.1
350*150	79.04.403.1	31.70.412.1	31.71.412.1	31.85.378.1	600*450	79.04.254.1	31.70.911.1	31.71.911.1	31.85.938.1
350*200	79.04.462.1	31.70.421.1	31.71.421.1	31.85.389.1	600*500	79.04.260.1	31.70.941.1	31.71.941.1	31.85.962.1
350*250	79.04.478.1	31.70.433.1	31.71.433.1	31.85.414.1					
350*300	79.04.492.1	31.70.443.1	31.71.443.1	31.85.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	601.1	101.1
	200-600	602.1	102.1
20	40- 80	603.1	103.1
	100-600	604.1	104.1
25	40- 40	605.1	105.1
	50- 50	606.1	106.1
	80-100	607.1	107.1
	150-600	608.1	108.1
40	50- 50	610.1	109.1
	80- 80	611.1	110.1
	100-100	612.1	111.1
	150-300	613.1	113.1
	350-600	614.1	114.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.67.062.1	450	76.81.67.562.1
840	76.81.67.064.1	840	76.81.67.564.1
1230	76.81.67.066.1	1230	76.81.67.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.262.1	230	76.83.37.101.1
813	76.80.60.264.1	255	76.83.37.102.1
1219	76.80.60.266.1	305	76.83.37.103.1
1524	76.80.60.268.1	355	76.83.37.105.1
1829	76.80.60.270.1	405	76.83.37.106.1
2134	76.80.60.272.1	455	76.83.37.107.1
2438	76.80.60.274.1		
2743	76.80.60.276.1		
3048	76.80.60.278.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	63.155.1	15	4	1/2	*	70	63.155.1
20	4	5/8	*	80	63.269.1	20	4	5/8	*	80	63.269.1
25	4	5/8	*	80	63.269.1	25	4	5/8	*	90	63.271.1
40	4	3/4	*	90	63.327.1	40	4	3/4	*	100	63.329.1
50	8	5/8	*	90	63.271.1						
80	8	3/4	*	110	63.330.1						
100	8	3/4	*	120	63.332.1						
150	12	3/4	*	130	63.334.1						
200	12	7/8	*	140	63.404.1						
250	16	1	*	160	63.472.1						
300	16	1 1/8	*	170	63.532.1						
350	20	1 1/8	*	180	63.533.1						
400	20	1 1/4	*	190	63.592.1						
450	24	1 1/4	*	200	63.588.1						
500	24	1 1/4	*	210	63.595.1						
600	24	1 1/2	*	240	63.687.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.103.1	
BLIND FLANGE	1	76.62.12.508.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* DRAIN POINT	DN 20	FIG.2J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.104.1	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.269.1	
WELDING NECK FLANGE	1	76.62.82.804.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.104.1	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.63.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.33.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
	8	81.38.63.155.1	
WELDING NECK FLANGE	2	76.62.82.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	4	81.38.63.155.1	
	4	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.33.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
STUD BOLT WITH NUTS	4	81.38.63.155.1	
	4	81.38.63.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.33.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
	8	81.38.63.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.63.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.63.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.508.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.30.33.053.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.33.054.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.269.1	
WELDING NECK FLANGE	1	76.62.82.804.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.33.054.1	
STUD BOLT WITH NUTS	8	81.38.63.269.1	

CLASS 31173

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	-50	0	50	75	100	125	150	175	200
	PRESSURE BAR GA								
DN15 -80	47.9	47.9	47.3	46.0	45.0	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-400	31.0	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3, AND LIMITED BY BS5351 BALL VALVE RATING
- WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.
- FOR AMMONIA, SODIUM, SODIUM-CARBONATE AND SODIUM-SULFHITE SERVICES, THROUGH-VISION LEVELGAUGES SHALL BE USED ONLY. PTFE-SHIELDS SHALL BE APPLIED.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	D	E	E	E	E	E	E	E	E	E	A	50 40
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 40
250	C	C	C	C	D	D	D	D	D	A							100 40
200	C	C	C	C	D	D	D	D	D	A							150 40
150	C	C	C	C	D	D	D	D	D	A							200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 30
40	C	B	B	A													400 30
25	B	B	A														450 20
20	B	A															500 20
15	A																600 20

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
 B REDUCING TEE
 C BRANCH FITTING
 D PIPE TO PIPE
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR PWHT	PLANT :	
CLASS NO. : 31173	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 31173, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/LCC TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A350-LF2
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7/A194-4
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7/A194-4
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
ITEM DESCRIPTION		MESC																

* PIPE																		
PIPE		74.30.17	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	093.1	105.1	117.1	130.1	140.1	164.1	204.1	234.1
PIPE NIPPLE 50MM		76.31.57	531.1	541.1	551.1	571.1												
* FLANGES																		
BLIND FLANGE		76.62.12	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1	534.1	536.1	538.1	540.1	542.1
SPECTACLE BLIND FLANGE		76.88.34	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1	284.1	286.1	288.1	290.1	294.1
SPACER RING TYPE (ASME FLANGE)		76.88.17	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
WELDING NECK FLANGE		76.62.82	802.1	804.1	808.1	810.1	760.1	762.1	764.1	766.1	708.1	710.1	712.1	714.1	716.1	678.1	680.1	684.1
* FITTINGS																		
CAP BUTT-WELD.END		76.31.18	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	384.1	394.1	404.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	384.1	394.1	404.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	384.1	394.1	404.1
EQUAL TEE BUTT-WELD ENDS		76.31.84	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	384.1	394.1	404.1
* VALVES																		
BALL VALVE RED. BORE FLANGED		77.00.38	303.1	304.1	305.1	307.1	308.1	310.1	312.1	364.1	365.1	366.1						
CHECK VALVE FLANGED		77.10.38	353.1	354.1	355.1	357.1	358.1	360.1	362.1	364.1	365.1	366.1	367.1	368.1	369.1	370.1	371.1	373.1
GATE VALVE FLANGED		77.20.38								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.38	353.1	354.1	355.1	357.1	358.1	360.1	362.1	364.1	365.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	312.1	314.1	316.1	318.1												
ORIFICE FLANGE SET		76.62.96					640.1	642.1	544.1	546.1	520.1	522.1	524.1	526.1	528.1	514.1	516.1	518.1
STRAINER Y-TYPE		76.83.19					826.1	828.1	830.1	832.1	834.1	836.1	838.1	840.1	842.1			

BROB	RECB	REEB	TERB	BROB	RECB	REEB	TERB
76.	76.	76.	76.	76.	76.	76.	76.
RUN* BR							
20* 15	31.70.137.1	31.71.137.1	31.85.035.1	400* 50	79.04.370.1		
25* 15	31.70.147.1	31.71.147.1	31.85.045.1	400* 80	79.04.382.1		
25* 20	31.70.157.1	31.71.157.1	31.85.055.1	400*100	79.04.394.1		
40* 15	31.70.167.1	31.71.167.1	31.85.065.1	400*150	79.04.404.1	29.44.752.1	29.59.752.1
40* 20	31.70.177.1	31.71.177.1	31.85.075.1	400*200	79.04.464.1	31.70.452.1	31.71.452.1
40* 25	31.70.187.1	31.71.187.1	31.85.085.1	400*250	79.04.480.1	31.70.461.1	31.71.461.1
50* 20	29.44.192.1	29.59.192.1	31.85.100.1	400*300	79.04.494.1	31.70.473.1	31.71.473.1
50* 25	31.70.198.1	31.71.198.1	31.85.109.1	400*350	79.04.506.1	31.70.484.1	31.71.484.1
50* 40	31.70.206.1	31.71.206.1	31.85.118.1	450* 50	79.04.279.1		
80* 40	31.70.226.1	31.71.226.1	31.85.127.1	450* 80	79.04.291.1		
80* 50	79.04.810.1	31.71.235.1	31.85.132.1	450*100	79.04.303.1		
100* 40		31.71.250.1	31.85.145.1	450*150	79.04.313.1		
100* 50	79.04.812.1	31.71.265.1	31.85.153.1	450*200	79.04.109.1	31.70.509.1	31.71.509.1
100* 80	79.04.836.1	31.71.275.1	31.85.165.1	450*250	79.04.116.1	31.70.532.1	31.71.532.1
150* 50	79.04.814.1		450*300	79.04.122.1	31.70.562.1	31.71.562.1	31.85.634.1
150* 80	79.04.838.1	31.71.295.1	31.85.177.1	450*350	79.04.127.1	31.70.594.1	31.71.594.1
150*100	79.04.860.1	31.71.305.1	31.85.189.1	450*400	79.04.131.1	31.70.624.1	31.71.624.1
200* 50	79.04.366.1		500* 50	79.04.280.1			
200* 80	79.04.378.1		500* 80	79.04.292.1			
200*100	79.04.390.1	31.70.324.1	31.71.324.1	500*100	79.04.304.1		
200*150	79.04.400.1	31.70.334.1	31.71.334.1	500*150	79.04.314.1		
250* 50	79.04.367.1		500*200	79.04.110.1	29.44.909.1	29.59.909.1	31.85.706.1
250* 80	79.04.379.1		500*250	79.04.117.1	31.70.639.1	31.71.639.1	31.85.730.1
250*100	79.04.391.1	29.44.342.1	29.59.342.1	500*300	79.04.123.1	31.70.652.1	31.71.652.1
250*150	79.04.401.1	31.70.352.1	31.71.352.1	500*350	79.04.128.1	31.70.684.1	31.71.684.1
250*200	79.04.458.1	31.70.363.1	31.71.363.1	500*400	79.04.132.1	31.70.714.1	31.71.714.1
300* 50	79.04.368.1		500*450	79.04.250.1	31.70.731.1	31.71.731.1	31.85.818.1
300* 80	79.04.380.1		600* 50	79.04.282.1			
300*100	79.04.392.1		600* 80	79.04.294.1			
300*150	79.04.402.1	31.70.381.1	31.71.381.1	600*100	79.04.306.1		
300*200	79.04.460.1	31.70.394.1	31.71.394.1	600*150	79.04.316.1		
300*250	79.04.476.1	31.70.403.1	31.71.403.1	600*250	79.04.118.1	31.70.809.1	31.71.809.1
350* 50	79.04.369.1		600*300	79.04.124.1	31.70.829.1	31.71.829.1	31.85.874.1
350* 80	79.04.381.1		600*350	79.04.129.1	31.70.849.1	31.71.849.1	31.85.898.1
350*100	79.04.393.1		600*400	79.04.133.1	31.70.894.1	31.71.894.1	31.85.922.1
350*150	79.04.403.1	31.70.412.1	31.71.412.1	600*450	79.04.254.1	31.70.911.1	31.71.911.1
350*200	79.04.462.1	31.70.421.1	31.71.421.1	600*500	79.04.260.1	31.70.941.1	31.71.941.1
350*250	79.04.478.1	31.70.433.1	31.71.433.1	31.85.414.1			
350*300	79.04.492.1	31.70.443.1	31.71.443.1	31.85.440.1			

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.37	76.80.31
15	40-150	601.1	101.1
	200-600	602.1	102.1
20	40- 80	603.1	103.1
	100-600	604.1	104.1
25	40- 40	605.1	105.1
	50- 50	606.1	106.1
	80-100	607.1	107.1
	150-600	608.1	108.1
40	50- 50	610.1	109.1
	80- 80	611.1	110.1
	100-100	612.1	111.1
	150-300	613.1	113.1
	350-600	614.1	114.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450	76.81.67.162.1
840	76.81.67.164.1
1230	76.81.67.166.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356	76.80.59.262.1
813	76.80.59.264.1
1219	76.80.59.266.1
1524	76.80.59.268.1
1829	76.80.59.270.1
2134	76.80.59.272.1
2438	76.80.59.274.1
2743	76.80.59.276.1
3048	76.80.59.278.1

COMP.	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	63.155.1	15	4	1/2	*	70	63.155.1
20	4	5/8	*	80	63.269.1	20	4	5/8	*	80	63.269.1
25	4	5/8	*	80	63.269.1	25	4	5/8	*	90	63.271.1
40	4	3/4	*	90	63.327.1	40	4	3/4	*	100	63.329.1
50	8	5/8	*	90	63.271.1						
80	8	3/4	*	110	63.330.1						
100	8	3/4	*	120	63.332.1						
150	12	3/4	*	130	63.334.1						
200	12	7/8	*	140	63.404.1						
250	16	1	*	160	63.472.1						
300	16	1 1/8	*	170	63.532.1						
350	20	1 1/8	*	180	63.533.1						
400	20	1 1/4	*	190	63.592.1						
450	24	1 1/4	*	200	63.588.1						
500	24	1 1/4	*	210	63.595.1						
600	24	1 1/2	*	240	63.687.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.303.1	
BLIND FLANGE	1	76.62.12.508.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* DRAIN POINT	DN 20	FIG.2J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.304.1	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.269.1	
WELDING NECK FLANGE	1	76.62.82.804.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.304.1	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.63.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.38.303.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
	8	81.38.63.155.1	
WELDING NECK FLANGE	2	76.62.82.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.303.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	4	81.38.63.155.1	
	4	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.38.303.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
STUD BOLT WITH NUTS	4	81.38.63.155.1	
	4	81.38.63.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.38.303.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
	8	81.38.63.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.63.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.63.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.508.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.30.38.353.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.38.354.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.269.1	
WELDING NECK FLANGE	1	76.62.82.804.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.38.354.1	
STUD BOLT WITH NUTS	8	81.38.63.269.1	

CLASS 31175

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	-50	0	50	100	150	200	250	300	340	
PRESSURE BAR GA										
DN15 -600	47.9	47.9	47.3	45.0	44.1	42.8	40.7	37.8	36.2	

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
- COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A	25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A		40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A			50	40
300	C	C	C	C	E	E	E	E	E	E	E	A				80	40
250	C	C	C	C	E	E	E	E	E	E	A					100	40
200	C	C	C	C	E	E	E	E	E	A						150	40
150	C	C	C	C	E	E	E	E	A							200	30
100	C	C	C	C	D	D	A									250	30
80	C	C	C	C	D	A										300	30
50	C	C	C	B	A											350	30
40	C	B	B	A												400	30
25	B	B	A													450	30
20	B	A														500	30
15	A															600	30

CODE	EXPLANATION OF CHARACTERS
----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	SOUR	PLANT	:	
CLASS NO.	: 31175	CONSIGNEE	:	
ANS RATING	: CLASS 300	ENGINEERED BY	:	
CORR. ALL.	: 1 mm.	PRINCIPAL	:	
REV. LETTER	: A	CONTR.JOB NO.	:	
REV. DATE	: 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	LJ END FLANGES: ASTM A350-LF2 ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.16	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	093.1	105.1	117.1	130.1	140.1	166.1	206.1	236.1
PIPE NIPPLE 50MM		76.31.57	631.1	641.1	651.1	671.1												
* FLANGES																		
BLIND FLANGE		76.62.12	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1	534.1	536.1	538.1	540.1	542.1
SPECTACLE BLIND FLANGE		76.88.35	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1	284.1	286.1	288.1	290.1	294.1
SPACER RING TYPE (ASME FLANGE)		76.88.47	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
WELDING NECK FLANGE		76.62.82	802.1	804.1	808.1	810.1	760.1	762.1	764.1	766.1	708.1	710.1	712.1	714.1	716.1	718.1	720.1	724.1
* FITTINGS																		
CAP BUTT-WELD.END		76.31.17	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	385.1	395.1	405.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.34	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	385.1	395.1	405.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.43	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	385.1	395.1	405.1
EQUAL TEE BUTT-WELD ENDS		76.31.80	168.1	174.1	180.1	188.1	208.1	228.1	246.1	266.1	283.1	304.1	326.1	346.1	366.1	385.1	395.1	405.1
* VALVES																		
CHECK VALVE FLANGED		77.10.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.20.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.30.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	312.1	314.1	316.1	318.1												
ORIFICE FLANGE SET		76.62.97					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
STRAINER Y-TYPE		76.83.22					552.1	554.1	556.1	558.1	560.1	562.1	564.1	566.1	568.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		31.66.137.1	31.75.137.1	31.88.035.1	400* 50	79.04.370.1			
25* 15		31.66.147.1	31.75.147.1	31.88.045.1	400* 80	79.04.382.1			
25* 20		31.66.157.1	31.75.157.1	31.88.055.1	400*100	79.04.394.1			
40* 15		31.66.167.1	31.75.167.1	31.88.065.1	400*150	79.04.404.1	29.45.752.1	29.60.752.1	31.88.468.1
40* 20		31.66.177.1	31.75.177.1	31.88.075.1	400*200	79.04.464.1	31.66.452.1	31.75.452.1	31.88.478.1
40* 25		31.66.187.1	31.75.187.1	31.88.085.1	400*250	79.04.480.1	31.66.461.1	31.75.461.1	31.88.504.1
50* 20		31.66.192.1	31.75.192.1	31.88.100.1	400*300	79.04.494.1	31.66.473.1	31.75.473.1	31.88.530.1
50* 25		31.66.198.1	31.75.198.1	31.88.109.1	400*350	79.04.506.1	31.66.484.1	31.75.484.1	31.88.555.1
50* 40		31.66.206.1	31.75.206.1	31.88.118.1	450* 50	79.04.371.1			
80* 40		31.66.226.1	31.75.226.1	31.88.127.1	450* 80	79.04.383.1			
80* 50	79.04.810.1	31.66.235.1	31.75.235.1	31.88.132.1	450*100	79.04.395.1			
100* 40		31.66.250.1	31.75.250.1	31.88.145.1	450*150	79.04.405.1			
100* 50	79.04.812.1	31.66.265.1	31.75.265.1	31.88.153.1	450*200	79.04.466.1	31.66.502.1	31.75.502.1	31.88.579.1
100* 80	79.04.836.1	31.66.275.1	31.75.275.1	31.88.165.1	450*250	79.04.482.1	31.66.521.1	31.75.521.1	31.88.603.1
150* 50	79.04.814.1				450*300	79.04.496.1	31.66.551.1	31.75.551.1	31.88.627.1
150* 80	79.04.838.1	31.66.295.1	31.75.295.1	31.88.177.1	450*350	79.04.508.1	31.66.582.1	31.75.582.1	31.88.651.1
150*100	79.04.860.1	31.66.305.1	31.75.305.1	31.88.189.1	450*400	79.04.518.1	31.66.612.1	31.75.612.1	31.88.675.1
200* 50	79.04.366.1				500* 50	79.04.372.1			
200* 80	79.04.378.1				500* 80	79.04.384.1			
200*100	79.04.390.1	31.66.324.1	31.75.324.1	31.88.211.1	500*100	79.04.396.1			
200*150	79.04.400.1	31.66.334.1	31.75.334.1	31.88.231.1	500*150	79.04.406.1			
250* 50	79.04.367.1				500*200	79.04.468.1	29.45.901.1	29.60.901.1	31.88.699.1
250* 80	79.04.379.1				500*250	79.04.484.1	31.66.634.1	31.75.634.1	31.88.723.1
250*100	79.04.391.1	29.45.342.1	29.60.342.1	31.88.259.1	500*300	79.04.498.1	31.66.641.1	31.75.641.1	31.88.747.1
250*150	79.04.401.1	31.66.352.1	31.75.352.1	31.88.277.1	500*350	79.04.510.1	31.66.672.1	31.75.672.1	31.88.771.1
250*200	79.04.458.1	31.66.363.1	31.75.363.1	31.88.290.1	500*400	79.04.520.1	31.66.702.1	31.75.702.1	31.88.795.1
300* 50	79.04.368.1				500*450	79.04.528.1	31.66.732.1	31.75.732.1	31.88.819.1
300* 80	79.04.380.1				600* 50	79.04.374.1			
300*100	79.04.392.1				600* 80	79.04.386.1			
300*150	79.04.402.1	31.66.381.1	31.75.381.1	31.88.316.1	600*100	79.04.398.1			
300*200	79.04.460.1	31.66.394.1	31.75.394.1	31.88.327.1	600*150	79.04.408.1			
300*250	79.04.476.1	31.66.403.1	31.75.403.1	31.88.349.1	600*200	79.04.472.1			
350* 50	79.04.369.1				600*250	79.04.488.1	31.66.802.1	31.75.802.1	31.88.843.1
350* 80	79.04.381.1				600*300	79.04.502.1	31.66.822.1	31.75.822.1	31.88.867.1
350*100	79.04.393.1				600*350	79.04.514.1	31.66.842.1	31.75.842.1	31.88.891.1
350*150	79.04.403.1	31.66.412.1	31.75.412.1	31.88.378.1	600*400	79.04.524.1	31.66.882.1	31.75.882.1	31.88.915.1
350*200	79.04.462.1	31.66.421.1	31.75.421.1	31.88.389.1	600*450	79.04.532.1	31.66.912.1	31.75.912.1	31.88.939.1
350*250	79.04.478.1	31.66.433.1	31.75.433.1	31.88.414.1	600*500	79.04.538.1	31.66.942.1	31.75.942.1	31.88.963.1
350*300	79.04.492.1	31.66.443.1	31.75.443.1	31.88.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	601.1	101.1
	200-600	602.1	102.1
20	40- 80	603.1	103.1
	100-600	604.1	104.1
25	40- 40	605.1	105.1
	50- 50	606.1	106.1
	80-100	607.1	107.1
	150-600	608.1	108.1
40	50- 50	610.1	109.1
	80- 80	611.1	110.1
	100-100	612.1	111.1
	150-300	613.1	113.1
	350-600	614.1	114.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.602.1			230 76.83.37.101.1
813	76.80.60.604.1			255 76.83.37.102.1
1219	76.80.60.606.1			305 76.83.37.103.1
1524	76.80.60.608.1			355 76.83.37.105.1
1829	76.80.60.610.1			405 76.83.37.106.1
2134	76.80.60.612.1			455 76.83.37.107.1
2438	76.80.60.614.1			
2743	76.80.60.616.1			
3048	76.80.60.618.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	67.155.1	15	4	1/2	*	70	67.155.1
20	4	5/8	*	80	67.269.1	20	4	5/8	*	80	67.269.1
25	4	5/8	*	80	67.269.1	25	4	5/8	*	90	67.271.1
40	4	3/4	*	90	67.327.1	40	4	3/4	*	100	67.329.1
50	8	5/8	*	90	67.271.1						
80	8	3/4	*	110	67.330.1						
100	8	3/4	*	120	67.332.1						
150	12	3/4	*	130	67.334.1						
200	12	7/8	*	140	67.404.1						
250	16	1	*	160	67.472.1						
300	16	1 1/8	*	170	67.532.1						
350	20	1 1/8	*	180	67.533.1						
400	20	1 1/4	*	190	67.592.1						
450	24	1 1/4	*	200	67.588.1						
500	24	1 1/4	*	210	67.595.1						
600	24	1 1/2	*	240	67.687.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	80	67.157.1	
					20	4	5/8	*	90	67.271.1	
					25	4	5/8	*	90	67.271.1	
					40	4	3/4	*	100	67.329.1	
50	8	5/8	*	150	67.281.1	50	8	5/8	*	100	67.273.1
80	8	3/4	*	150	67.337.1	80	8	3/4	*	120	67.332.1
100	12	3/4	*	140	67.335.1	100	8	3/4	*	130	67.334.1
150	12	3/4	*	140	67.335.1	150	12	3/4	*	150	67.337.1
200	12	7/8	*	150	67.406.1	200	12	7/8	*	170	67.409.1
250	16	1	*	170	67.474.1	250	16	1	*	190	67.477.1
300	16	1 1/8	*	190	67.535.1	300	16	1 1/8	*	210	67.538.1
350	20	1 1/8	*	200	67.544.1	350	20	1 1/8	*	220	67.540.1
400	20	1 1/4	*	210	67.595.1	400	20	1 1/4	*	240	67.600.1
450	24	1 1/4	*	220	67.597.1	450	24	1 1/4	*	250	67.606.1
500	24	1 1/4	*	230	67.598.1	500	24	1 1/4	*	260	67.603.1
600	24	1 1/2	*	260	67.690.1	600	24	1 1/2	*	300	67.696.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.508.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.20.33.053.1	
PIPE NIPPLE 50MM	1	76.31.57.631.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GATE VALVE FLANGED	1	77.20.33.054.1	
PIPE NIPPLE 50MM	1	76.31.57.641.1	
STUD BOLT WITH NUTS	8	81.38.67.269.1	
WELDING NECK FLANGE	1	76.62.82.804.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GATE VALVE FLANGED	1	77.20.33.054.1	
STUD BOLT WITH NUTS	8	81.38.67.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.20.33.053.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
	8	81.38.67.155.1	
WELDING NECK FLANGE	2	76.62.82.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.20.33.053.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
PIPE NIPPLE 50MM	1	76.31.57.631.1	
STUD BOLT WITH NUTS	4	81.38.67.155.1	
	4	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.20.33.053.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
STUD BOLT WITH NUTS	4	81.38.67.155.1	
	4	81.38.67.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.20.33.053.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
	8	81.38.67.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.67.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.67.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.508.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.30.33.053.1	
PIPE NIPPLE 50MM	1	76.31.57.631.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.802.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.33.054.1	
PIPE NIPPLE 50MM	1	76.31.57.641.1	
STUD BOLT WITH NUTS	8	81.38.67.269.1	
WELDING NECK FLANGE	1	76.62.82.804.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.33.054.1	
STUD BOLT WITH NUTS	8	81.38.67.269.1	

CLASS 31176

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
		-50	0	50	100	150	200	250	300	340

		PRESSURE BAR GA								
DN15	-600	47.9	47.9	47.3	45.0	44.1	42.8	40.7	37.8	36.2

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	80
300	C	C	C	C	E	E	E	E	E	E	E	E					80	80
250	C	C	C	C	E	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	E	A							150	80
150	C	C	C	C	D	D	D	A									200	40
100	C	C	C	C	D	D	D	A									250	40
80	C	C	C	C	D	A											300	40
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	SOUR	PLANT	:	
CLASS NO. : 31176		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY	:	
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : B		CONTR.JOB NO.	:	
REV. DATE : 12/98		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7M/A194-7M
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																	
PIPE	74.30.16	023.1	030.1	038.1	054.1	061.1	069.1	077.1	086.1	095.1	107.1	119.1	132.1	142.1	170.1	210.1	240.1
* FLANGES																	
BLIND FLANGE	76.62.12	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1	534.1	536.1	538.1	540.1	542.1
SPECTACLE BLIND FLANGE	76.88.35	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1	284.1	286.1	288.1	290.1	294.1
SPACER RING TYPE (ASME FLANGE)	76.88.47	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
WELDING NECK FLANGE	76.62.82	852.1	854.1	856.1	858.1	812.1	814.1	816.1	818.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	782.1
* FITTINGS																	
CAP BUTT-WELD.END	76.31.17	172.1	178.1	182.1	192.1	210.1	230.1	248.1	268.1	284.1	306.1	328.1	348.1	368.1	386.1	396.1	406.1
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	172.1	178.1	182.1	192.1	210.1	230.1	248.1	268.1	284.1	306.1	328.1	348.1	368.1	386.1	396.1	406.1
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	172.1	178.1	182.1	192.1	210.1	230.1	248.1	268.1	284.1	306.1	328.1	348.1	368.1	386.1	396.1	406.1
EQUAL TEE BUTT-WELD ENDS	76.31.80	172.1	178.1	182.1	192.1	210.1	230.1	248.1	268.1	284.1	306.1	328.1	348.1	368.1	386.1	396.1	406.1
* VALVES																	
CHECK VALVE FLANGED	77.10.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED	77.20.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED	77.30.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN	76.65.96	312.1	314.1	316.1	318.1												
ORIFICE FLANGE SET	76.62.97					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
STRAINER Y-TYPE	76.83.22					576.1	578.1	580.1	582.1	584.1	586.1	588.1	590.1	592.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		31.66.141.1	31.75.141.1	31.88.039.1	400* 50	79.05.074.1			
25* 15		31.66.151.1	31.75.151.1	31.88.049.1	400* 80	79.05.098.1			
25* 20		31.66.161.1	31.75.161.1	31.88.059.1	400*100	79.05.120.1			
40* 15		31.66.171.1	31.75.171.1	31.88.069.1	400*150	79.05.140.1	29.45.754.1	29.60.754.1	31.88.469.1
40* 20		31.66.181.1	31.75.181.1	31.88.079.1	400*200	79.04.908.1	31.66.453.1	31.75.453.1	31.88.479.1
40* 25		31.66.191.1	31.75.191.1	31.88.089.1	400*250	79.04.924.1	31.66.462.1	31.75.462.1	31.88.505.1
50* 20		31.66.193.1	31.75.193.1	31.88.102.1	400*300	79.04.938.1	31.66.474.1	31.75.474.1	31.88.531.1
50* 25		31.66.199.1	31.75.199.1	31.88.111.1	400*350	79.04.950.1	31.66.487.1	31.75.487.1	31.88.556.1
50* 40		31.66.208.1	31.75.208.1	31.88.120.1	450* 50	79.05.076.1			
80* 40		31.66.229.1	31.75.229.1	31.88.129.1	450* 80	79.05.100.1			
80* 50	79.05.360.1	31.66.237.1	31.75.237.1	31.88.133.1	450*100	79.05.122.1			
100* 40		31.66.253.1	31.75.253.1	31.88.147.1	450*150	79.05.142.1			
100* 50	79.05.362.1	31.66.267.1	31.75.267.1	31.88.154.1	450*200	79.04.910.1	31.66.503.1	31.75.503.1	31.88.580.1
100* 80	79.05.386.1	31.66.277.1	31.75.277.1	31.88.166.1	450*250	79.04.926.1	31.66.523.1	31.75.523.1	31.88.604.1
150* 50	79.05.364.1				450*300	79.04.940.1	31.66.553.1	31.75.553.1	31.88.628.1
150* 80	79.05.388.1	31.66.297.1	31.75.297.1	31.88.178.1	450*350	79.04.952.1	31.66.584.1	31.75.584.1	31.88.652.1
150*100	79.05.410.1	31.66.307.1	31.75.307.1	31.88.190.1	450*400	79.04.962.1	31.66.614.1	31.75.614.1	31.88.676.1
200* 50	79.05.066.1				500* 50	79.05.078.1			
200* 80	79.05.090.1				500* 80	79.05.102.1			
200*100	79.05.112.1	31.66.326.1	31.75.326.1	31.88.212.1	500*100	79.05.124.1			
200*150	79.05.132.1	31.66.336.1	31.75.336.1	31.88.232.1	500*150	79.05.144.1			
250* 50	79.05.068.1				500*200	79.04.912.1	29.45.902.1	29.60.902.1	31.88.700.1
250* 80	79.05.092.1				500*250	79.04.928.1	31.66.635.1	31.75.635.1	31.88.724.1
250*100	79.05.114.1	31.66.344.1	31.75.344.1	31.88.261.1	500*300	79.04.942.1	31.66.643.1	31.75.643.1	31.88.748.1
250*150	79.05.134.1	31.66.356.1	31.75.356.1	31.88.278.1	500*350	79.04.954.1	31.66.674.1	31.75.674.1	31.88.772.1
250*200	79.04.902.1	31.66.365.1	31.75.365.1	31.88.291.1	500*400	79.04.964.1	31.66.704.1	31.75.704.1	31.88.796.1
300* 50	79.05.070.1				500*450	79.04.972.1	31.66.734.1	31.75.734.1	31.88.820.1
300* 80	79.05.094.1				600* 50	79.05.082.1			
300*100	79.05.116.1				600* 80	79.05.106.1			
300*150	79.05.136.1	31.66.384.1	31.75.384.1	31.88.317.1	600*100	79.05.128.1			
300*200	79.04.904.1	31.66.396.1	31.75.396.1	31.88.328.1	600*150	79.05.148.1			
300*250	79.04.920.1	31.66.404.1	31.75.404.1	31.88.350.1	600*200	79.04.916.1			
350* 50	79.05.072.1				600*250	79.04.932.1	31.66.803.1	31.75.803.1	31.88.844.1
350* 80	79.05.096.1				600*300	79.04.946.1	31.66.823.1	31.75.823.1	31.88.868.1
350*100	79.05.118.1				600*350	79.04.958.1	31.66.843.1	31.75.843.1	31.88.892.1
350*150	79.05.138.1	31.66.414.1	31.75.414.1	31.88.379.1	600*400	79.04.968.1	31.66.884.1	31.75.884.1	31.88.916.1
350*200	79.04.906.1	31.66.422.1	31.75.422.1	31.88.390.1	600*450	79.04.976.1	31.66.914.1	31.75.914.1	31.88.940.1
350*250	79.04.922.1	31.66.438.1	31.75.438.1	31.88.415.1	600*500	79.04.982.1	31.66.944.1	31.75.944.1	31.88.964.1
350*300	79.04.936.1	31.66.447.1	31.75.447.1	31.88.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	621.1	116.1
20	40-600	623.1	118.1
25	40-100	625.1	120.1
	150-600	626.1	124.1
40	50-100	630.1	126.1
	150-600	631.1	128.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
450	76.81.68.062.1	450	76.81.68.562.1
840	76.81.68.064.1	840	76.81.68.564.1
1230	76.81.68.066.1	1230	76.81.68.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.60.602.1	230	76.83.37.101.1
813	76.80.60.604.1	255	76.83.37.102.1
1219	76.80.60.606.1	305	76.83.37.103.1
1524	76.80.60.608.1	355	76.83.37.105.1
1829	76.80.60.610.1	405	76.83.37.106.1
2134	76.80.60.612.1	455	76.83.37.107.1
2438	76.80.60.614.1		
2743	76.80.60.616.1		
3048	76.80.60.618.1		

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	67.155.1	15	4	1/2	*	70	67.155.1
20	4	5/8	*	80	67.269.1	20	4	5/8	*	80	67.269.1
25	4	5/8	*	80	67.269.1	25	4	5/8	*	90	67.271.1
40	4	3/4	*	90	67.327.1	40	4	3/4	*	100	67.329.1
50	8	5/8	*	90	67.271.1						
80	8	3/4	*	110	67.330.1						
100	8	3/4	*	120	67.332.1						
150	12	3/4	*	130	67.334.1						
200	12	7/8	*	140	67.404.1						
250	16	1	*	160	67.472.1						
300	16	1 1/8	*	170	67.532.1						
350	20	1 1/8	*	180	67.533.1						
400	20	1 1/4	*	190	67.592.1						
450	24	1 1/4	*	200	67.588.1						
500	24	1 1/4	*	210	67.595.1						
600	24	1 1/2	*	240	67.687.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.508.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.20.33.053.1	
PIPE NIPPLE 50MM	1	76.31.57.636.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.852.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GATE VALVE FLANGED	1	77.20.33.054.1	
PIPE NIPPLE 50MM	1	76.31.57.646.1	
STUD BOLT WITH NUTS	8	81.38.67.269.1	
WELDING NECK FLANGE	1	76.62.82.854.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GATE VALVE FLANGED	1	77.20.33.054.1	
STUD BOLT WITH NUTS	8	81.38.67.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.20.33.053.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
	8	81.38.67.155.1	
WELDING NECK FLANGE	2	76.62.82.852.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.20.33.053.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
PIPE NIPPLE 50MM	1	76.31.57.636.1	
STUD BOLT WITH NUTS	4	81.38.67.155.1	
	4	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.852.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.20.33.053.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
STUD BOLT WITH NUTS	4	81.38.67.155.1	
	4	81.38.67.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.20.33.053.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
	8	81.38.67.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.67.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.67.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.508.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.30.33.053.1	
PIPE NIPPLE 50MM	1	76.31.57.636.1	
STUD BOLT WITH NUTS	8	81.38.67.155.1	
WELDING NECK FLANGE	1	76.62.82.852.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.33.054.1	
PIPE NIPPLE 50MM	1	76.31.57.646.1	
STUD BOLT WITH NUTS	8	81.38.67.269.1	
WELDING NECK FLANGE	1	76.62.82.854.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.512.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.33.054.1	
STUD BOLT WITH NUTS	8	81.38.67.269.1	

CLASS 31261

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
		0	50	100	150	200	250	300	350	400
		PRESSURE BAR GA								
DN15	-600	42.9	42.9	42.9	42.9	42.9	40.9	38.0	36.2	27.7

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- MAX. ALLOWABLE PRESS. FOR STEAMTRAPS : 28 BAR GA
- API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40 80
350	C	C	C	C	E	E	E	E	E	E	E	A					50 40
300	C	C	C	C	E	E	E	E	E	E	A						80 40
250	C	C	C	C	E	E	E	E	E	A							100 40
200	C	C	C	C	E	E	E	E	A								150 40
150	C	C	C	C	E	E	E	A									200 30
100	C	C	C	C	D	D	A										250 30
80	C	C	C	C	D	A											300 30
50	C	C	C	B	A												350 30
40	C	B	B	A													400 30
25	B	B	A														450 30
20	B	A															500 30
15	A																600 30

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
D PIPE TO PIPE
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 31261	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31261, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GABS	GATE VALVE SW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVS	GATE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLBS	GLOBE VALVE SW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
SIBS	STEAM TRAP INV.BUCKET S.W.	DN 15- 20	AISI 304(L)
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																	
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)	74.13.14								211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	
PIPE (API 5L-B, SAW)	74.13.17																579.1
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE	76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE	76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	236.1	257.1	278.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	786.1	807.1	828.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE SOCKET WELD	77.11.04	003.1	004.1	005.1	007.1												
GATE VALVE SW BELLOWS SEALED	77.21.05	053.1	054.1	055.1	057.1												
GATE VALVE FLANGED	77.20.04	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE SOCKET WELD	77.21.04	003.1	004.1	005.1	007.1												
GLOBE VALVE SW BELLOWS SEALED	77.31.03	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED	77.30.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
GLOBE VALVE SOCKET WELD	77.31.04	003.1	004.1	005.1	007.1												
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	070.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	092.1
METER RUN	76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	524.1
STEAM TRAP INV.BUCKET S.W.	76.83.30	008.1	010.1														
STRAINER Y-TYPE	76.83.19					452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.00.370.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.382.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.394.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.00.404.1	29.46.752.1	29.61.752.1	
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.00.464.1	30.72.452.1	30.73.452.1	30.89.478.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.00.480.1	30.72.461.1	30.73.461.1	30.89.504.1
50* 20		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.00.494.1	30.72.473.1	30.73.473.1	30.89.530.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.00.506.1	30.72.484.1	30.73.484.1	30.89.555.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.371.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.383.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.395.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.00.405.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.00.466.1	30.72.502.1	30.73.502.1	30.89.579.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.00.482.1	30.72.521.1	30.73.521.1	30.89.603.1
150* 50	79.00.814.1				450*300	79.00.496.1	30.72.551.1	30.73.551.1	30.89.627.1
150* 80	79.00.838.1	30.72.295.1	30.73.295.1	30.89.177.1	450*350	79.00.508.1	30.72.582.1	30.73.582.1	30.89.651.1
150*100	79.00.860.1	30.72.305.1	30.73.305.1	30.89.189.1	450*400	79.00.518.1	30.72.612.1	30.73.612.1	30.89.675.1
200* 50	79.00.366.1				500* 50	79.00.372.1			
200* 80	79.00.378.1				500* 80	79.00.384.1			
200*100	79.00.390.1	30.72.324.1	30.73.324.1	30.89.211.1	500*100	79.00.396.1			
200*150	79.00.400.1	30.72.334.1	30.73.334.1	30.89.231.1	500*150	79.00.406.1			
250* 50	79.00.367.1				500*200	79.00.468.1	29.46.901.1	29.61.901.1	30.89.699.1
250* 80	79.00.379.1				500*250	79.00.484.1	30.72.634.1	30.73.634.1	30.89.723.1
250*100	79.00.391.1	29.46.342.1	29.61.342.1	30.89.259.1	500*300	79.00.498.1	30.72.641.1	30.73.641.1	30.89.747.1
250*150	79.00.401.1	30.72.352.1	30.73.352.1	30.89.277.1	500*350	79.00.510.1	30.72.672.1	30.73.672.1	30.89.771.1
250*200	79.00.458.1	30.72.363.1	30.73.363.1	30.89.290.1	500*400	79.00.520.1	30.72.702.1	30.73.702.1	30.89.795.1
300* 50	79.00.368.1				500*450	79.00.528.1	30.72.732.1	30.73.732.1	30.89.819.1
300* 80	79.00.380.1				600* 50	79.00.374.1			
300*100	79.00.392.1				600* 80	79.00.386.1			
300*150	79.00.402.1	30.72.381.1	30.73.381.1	30.89.316.1	600*100	79.00.398.1			
300*200	79.00.460.1	30.72.394.1	30.73.394.1	30.89.327.1	600*150	79.00.408.1			
300*250	79.00.476.1	30.72.403.1	30.73.403.1	30.89.349.1	600*200	79.00.472.1			
350* 50	79.00.369.1				600*250	79.00.488.1	30.72.802.1	30.73.802.1	30.89.843.1
350* 80	79.00.381.1				600*300	79.00.502.1	30.72.822.1	30.73.822.1	30.89.867.1
350*100	79.00.393.1				600*350	79.00.514.1	30.72.842.1	30.73.842.1	30.89.891.1
350*150	79.00.403.1	30.72.412.1	30.73.412.1	30.89.378.1	600*400	79.00.524.1	30.72.882.1	30.73.882.1	30.89.915.1
350*200	79.00.462.1	30.72.421.1	30.73.421.1	30.89.389.1	600*450	79.00.532.1	30.72.912.1	30.73.912.1	30.89.939.1
350*250	79.00.478.1	30.72.433.1	30.73.433.1	30.89.414.1	600*500	79.00.538.1	30.72.942.1	30.73.942.1	30.89.963.1
350*300	79.00.492.1	30.72.443.1	30.73.443.1	30.89.440.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	101.1	001.1
	200-600	102.1	002.1
20	40- 80	103.1	003.1
	100-600	104.1	004.1
25	40- 40	105.1	005.1
	50- 50	106.1	006.1
	80-100	107.1	007.1
	150-600	108.1	008.1
40	50- 50	110.1	009.1
	80- 80	111.1	010.1
	100-100	112.1	011.1
	150-300	113.1	013.1
	350-600	114.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.062.1		230	76.83.37.101.1
813	76.80.60.064.1		255	76.83.37.102.1
1219	76.80.60.066.1		305	76.83.37.103.1
1524	76.80.60.068.1		355	76.83.37.105.1
1829	76.80.60.070.1		405	76.83.37.106.1
2134	76.80.60.072.1		455	76.83.37.107.1
2438	76.80.60.074.1			
2743	76.80.60.076.1			
3048	76.80.60.078.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* DRAIN POINT	DN 20	FIG.0E	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE SOCKET WELD	1	77.21.04.004.1	
PIPE NIPPLE 50MM	2	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

* DRAIN POINT	DN 20	FIG.0D	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE SOCKET WELD	1	77.21.04.004.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0D	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE SOCKET WELD	2	77.21.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.602.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0D	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.04.053.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.003.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* VENT POINT	DN 20	FIG.1E	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.004.1	
PIPE NIPPLE 50MM	2	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

* VENT POINT	DN 20	FIG.1D	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.004.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

CLASS 31271

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS			
-35	0	70	
PRESSURE BAR GA			
DN20 -150	30.0	30.0	30.0

- NOTES
- DESIGN LIMITS ACC.TO SERVICE CONDITIONS
 - ALL WELDS TO BE 100% RADIOGRAPHED.
 - NO ANGLE WELDS PERMITTED
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - THIS PIPING CLASS IS ORIGINALLY DESIGNED FOR LIQUID AND VAPOUR CHLORINE SERVICE

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE						
	25	50	100				
	20	40	80	150			
150	C	C	C	E	B	B	A
100	C	C	B	B	B	A	
80	C	C	B	B	A		
50	B	B	B	A			
40	B	B	A				
25	B	A					
20	A						

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	80
150	80

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	PLANT :	
CLASS NO. : 31271	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-150	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-150	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-150	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-150	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-150	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-150	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-150	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A420-WPL6

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-150	BODY: ASTM A352-LCB/C, A350-LF2
			TRIM: MONEL 400, PTFE

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-150	GRAPHITE
MTRR	METER RUN	DN 15- 40	AISI 316
			LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE								
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150

* PIPE										
PIPE		74.30.17	021.1	029.1	037.1	053.1	061.1	069.1	077.1	086.1
PIPE NIPPLE 50MM		76.31.57	531.1	541.1	551.1	571.1				
* FLANGES										
BLIND FLANGE		76.62.12	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1
SPECTACLE BLIND FLANGE		76.88.34	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1
SPACER RING TYPE (ASME FLANGE)		76.88.17	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1
WELDING NECK FLANGE		76.62.82	802.1	804.1	808.1	810.1	812.1	814.1	816.1	818.1
* FITTINGS										
CAP BUTT-WELD.END		76.31.18	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1
EQUAL TEE BUTT-WELD ENDS		76.31.84	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1
* VALVES										
BALL VALVE RED. BORE FLANGED		77.00.40	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1
* MISCELLANEOUS										
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1
METER RUN		76.65.96	312.1	314.1	316.1	318.1				
ORIFICE FLANGE SET		76.62.97					760.1	762.1	614.1	616.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		31.70.137.1	31.71.137.1	31.85.035.1
25* 15		31.70.147.1	31.71.147.1	31.85.045.1
25* 20		31.70.157.1	31.71.157.1	31.85.055.1
40* 15		31.70.167.1	31.71.167.1	31.85.065.1
40* 20		31.70.177.1	31.71.177.1	31.85.075.1
40* 25		31.70.187.1	31.71.187.1	31.85.085.1
50* 20		31.70.194.1	31.71.194.1	31.85.097.1
50* 25		31.70.197.1	31.71.197.1	31.85.106.1
50* 40		31.70.207.1	31.71.207.1	31.85.115.1
80* 40		31.70.227.1	31.71.227.1	31.85.124.1
80* 50	79.05.360.1	31.70.237.1	31.71.237.1	31.85.133.1
100* 40		31.70.251.1	31.71.251.1	31.85.142.1
100* 50	79.05.362.1	31.70.267.1	31.71.267.1	31.85.154.1
100* 80	79.05.386.1	31.70.277.1	31.71.277.1	31.85.166.1
150* 50	79.05.364.1			
150* 80	79.05.388.1	31.70.297.1	31.71.297.1	31.85.178.1
150*100	79.05.410.1	31.70.307.1	31.71.307.1	31.85.190.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	601.1	101.1
20	40- 80	603.1	103.1
	100-150	604.1	104.1
25	40- 40	605.1	105.1
	50- 50	606.1	106.1
	80-100	607.1	107.1
	150-150	608.1	108.1
40	50- 50	610.1	109.1
	80- 80	611.1	110.1
	100-100	612.1	111.1
	150-150	613.1	113.1

COMP.		THERMOWELL	
NAME	DESCRIPTION	LENGTH	MESCNUMBER
-----	-----	-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET	230	76.83.37.101.1
BNIP	BRANCH FITTING PLAIN-END OUTL.	255	76.83.37.102.1
BROB	BRANCH OUTLET RED. BUTT WELD	305	76.83.37.103.1
RECB	REDUCER CONC BUTT WELD ENDS	355	76.83.37.105.1
REEB	REDUCER ECC BUTT WELD ENDS	405	76.83.37.106.1
TERB	TEE REDUCING BUTT WELD ENDS	455	76.83.37.107.1

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	63.155.1	15	4	1/2	*	70	63.155.1
20	4	5/8	*	80	63.269.1	20	4	5/8	*	80	63.269.1
25	4	5/8	*	80	63.269.1	25	4	5/8	*	90	63.271.1
40	4	3/4	*	90	63.327.1	40	4	3/4	*	100	63.329.1
50	8	5/8	*	90	63.271.1						
80	8	3/4	*	110	63.330.1						
100	8	3/4	*	120	63.332.1						
150	12	3/4	*	130	63.334.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	80	63.157.1	
					20	4	5/8	*	90	63.271.1	
					25	4	5/8	*	90	63.271.1	
					40	4	3/4	*	100	63.329.1	
50	8	5/8	*	150	63.281.1	50	8	5/8	*	100	63.273.1
80	8	3/4	*	150	63.337.1	80	8	3/4	*	120	63.332.1
100	12	3/4	*	140	63.335.1	100	8	3/4	*	130	63.334.1
150	12	3/4	*	140	63.335.1	150	12	3/4	*	150	63.337.1

ASSEMBLIES

* DRAIN POINT DN 20 FIG.2J DN 20 - 50
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.00.40.104.1
BLIND FLANGE 1 76.62.12.512.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
PIPE NIPPLE 50MM 1 76.31.57.541.1
STUD BOLT WITH NUTS 8 81.38.63.269.1
WELDING NECK FLANGE 1 76.62.82.804.1

* DRAIN POINT DN 20 FIG.2H DN 80 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.00.40.104.1
BLIND FLANGE 1 76.62.12.512.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
STUD BOLT WITH NUTS 8 81.38.63.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.2I DN 50 -150
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 2 77.00.40.103.1
GASKET, RF TANGED INSERT 4 85.30.01.104.1
LAP-JOINT FLANGE 2 76.62.20.808.1
STUD BOLT WITH NUTS 8 81.38.63.155.1

WELDING NECK FLANGE 8 81.38.63.155.1

* PRESSURE INSTR.CONN. DN 15 FIG.2J DN 20 - 50
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.00.40.103.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
LAP-JOINT FLANGE 1 76.62.20.808.1
PIPE NIPPLE 50MM 1 76.31.57.531.1
STUD BOLT WITH NUTS 4 81.38.63.155.1
4 81.38.63.155.1
WELDING NECK FLANGE 1 76.62.82.802.1

* PRESSURE INSTR.CONN. DN 15 FIG.2H DN 80 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.00.40.103.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
LAP-JOINT FLANGE 1 76.62.20.808.1
STUD BOLT WITH NUTS 4 81.38.63.155.1
4 81.38.63.155.1

* METERRUN INSTR. CONN DN 15 FIG.2H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 2 77.00.40.103.1
GASKET, RF TANGED INSERT 4 85.30.01.104.1
LAP-JOINT FLANGE 2 76.62.20.808.1
STUD BOLT WITH NUTS 8 81.38.63.155.1
8 81.38.63.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.52.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.63.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.52.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.63.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 20 FIG.2J DN 20 - 50
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.00.40.104.1
BLIND FLANGE 1 76.62.12.512.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
PIPE NIPPLE 50MM 1 76.31.57.541.1
STUD BOLT WITH NUTS 8 81.38.63.269.1
WELDING NECK FLANGE 1 76.62.82.804.1

* VENT POINT DN 20 FIG.2H DN 80 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.00.40.104.1
BLIND FLANGE 1 76.62.12.512.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
STUD BOLT WITH NUTS 8 81.38.63.269.1

CLASS 31300

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
AND LIMITED BY BS5351 BALL VALVE RATING
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	A					50	40
300	C	C	C	C	E	E	E	E	E	E	A						80	40
250	C	C	C	C	E	E	E	E	E	A							100	40
200	C	C	C	C	E	E	E	E	A								150	40
150	C	C	C	C	E	E	E	A									200	30
100	C	C	C	C	D	D	A										250	30
80	C	C	C	C	D	A											300	30
50	C	C	C	B	A												350	30
40	C	B	B	A													400	30
25	B	B	A														450	20
20	B	A															500	20
15	A																600	20

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 31300	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31300, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-100	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-500	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN600-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L), PTFE
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT,STELLITE 6,FKM
GAVF	GATE VALVE FLANGED	DN300-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLBF	GLOBE VALVE FLG. BELLOWS SEAL.	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L), GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWGS	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

31300, REV.B PAGE 3

		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1									
PIPE (API 5L-B, EW)	74.13.14								211.1	241.1	283.1	325.1	377.1	425.1	469.1	521.1	
PIPE (API 5L-B, SAW)	74.13.17																569.1
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	425.1	469.1	521.1	569.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE	76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE	76.62.78	602.1	604.1	606.1	608.1	560.1	562.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	055.1	075.1	095.1	115.1	133.1	153.1	173.1	195.1	215.1	232.1	255.1	275.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	665.1	683.1	703.1	723.1	745.1	765.1	782.1	805.1	825.1
* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.00	253.1	254.1	255.1	257.1	258.1	260.1	262.1	264.1	265.1	266.1						
CHECK VALVE FLANGED	77.10.21	053.1	054.1	055.1	057.1												
DUAL PL. CHECK VALVE WAFER LUG	77.67.49					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	072.1
GATE VALVE FLANGED	77.20.20											467.1	468.1	469.1	470.1	471.1	473.1
GLOBE VALVE FLG. BELLOWS SEAL.	77.30.20	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1							
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.41.46	404.1	406.1	408.1	412.1	414.1	418.1	370.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1	388.1	392.1
METER RUN	76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	564.1	566.1	508.1	510.1	512.1	514.1	516.1	478.1	480.1	484.1

BROB					RECB					REEB					TERB					BNIF					BNIP																																		
76.					76.					76.					76.					76.80.37					76.80.31																																		
RUN* BR																				BRANCH					RUN-PIPE																																		
20* 15					30.72.137.1					30.73.137.1					30.89.035.1					400* 50					79.00.370.1					15					40-150					101.1					001.1														
25* 15					30.72.147.1					30.73.147.1					30.89.045.1					400* 80					79.00.382.1					20					200-600					102.1					002.1														
25* 20					30.72.157.1					30.73.157.1					30.89.055.1					400*100					79.00.394.1					25					40- 80					103.1					003.1														
40* 15					30.72.167.1					30.73.167.1					30.89.065.1					400*150					79.00.404.1					29.46.752.1					29.61.752.1					100-600					104.1					004.1									
40* 20					30.72.177.1					30.73.177.1					30.89.075.1					400*200					79.00.464.1					30.72.452.1					30.73.452.1					30.89.478.1					105.1					005.1									
40* 25					30.72.187.1					30.73.187.1					30.89.085.1					400*250					79.00.480.1					30.72.461.1					30.73.461.1					30.89.504.1					106.1					006.1									
50* 20					29.46.192.1					29.61.192.1					30.89.100.1					400*300					79.00.494.1					30.72.473.1					30.73.473.1					30.89.530.1					80-100					107.1					007.1				
50* 25					30.72.196.1					30.73.196.1					30.89.109.1					400*350					79.00.506.1					30.72.484.1					30.73.484.1					30.89.555.1					150-600					108.1					008.1				
50* 40					30.72.206.1					30.73.206.1					30.89.118.1					450* 50					79.00.279.1					40					50- 50					110.1					009.1														
80* 40					30.72.226.1					30.73.226.1					30.89.127.1					450* 80					79.00.291.1										80- 80					111.1					010.1														
80* 50					79.00.810.1					30.72.235.1					30.73.235.1					30.89.132.1					450*100					79.00.303.1										100-100					112.1					011.1									
100* 40										30.72.250.1					30.73.250.1					30.89.145.1					450*150					79.00.313.1										150-300					113.1					013.1									
100* 50					79.00.812.1					30.72.265.1					30.73.265.1					30.89.153.1					450*200					79.00.109.1					30.72.509.1					30.73.509.1					350-600					114.1					014.1				
100* 80					79.00.836.1					30.72.275.1					30.73.275.1					30.89.165.1					450*250					79.00.116.1					30.72.532.1					30.73.532.1																			
150* 50					79.00.814.1															450*300					79.00.122.1					30.72.562.1					30.73.562.1																								
150* 80					79.00.838.1					30.72.295.1					30.73.295.1					30.89.177.1					450*350					79.00.127.1					30.72.594.1					30.73.594.1																			
150*100					79.00.860.1					30.72.305.1					30.73.305.1					30.89.189.1					450*400					79.00.131.1					30.72.624.1					30.73.624.1																			
200* 50					79.00.366.1															500* 50					79.00.280.1																																		
200* 80					79.00.378.1															500* 80					79.00.292.1																																		
200*100					79.00.390.1					30.72.324.1					30.73.324.1					30.89.211.1					500*100					79.00.304.1																													
200*150					79.00.400.1					30.72.334.1					30.73.334.1					30.89.231.1					500*150					79.00.314.1																													
250* 50					79.00.367.1															500*200					79.00.110.1					29.46.909.1					29.61.909.1																								
250* 80					79.00.379.1															500*250					79.00.117.1					30.72.639.1					30.73.639.1																								
250*100					79.00.391.1					29.46.342.1					29.61.342.1					30.89.259.1					500*300					79.00.123.1					30.72.652.1					30.73.652.1																			
250*150					79.00.401.1					30.72.352.1					30.73.352.1					30.89.277.1					500*350					79.00.128.1					30.72.684.1					30.73.684.1										230									
250*200					79.00.458.1					30.72.363.1					30.73.363.1					30.89.290.1					500*400					79.00.132.1					30.72.714.1					30.73.714.1										255									
300* 50					79.00.368.1															500*450					79.00.250.1					30.72.731.1					30.73.731.1					30.89.818.1										305									
300* 80					79.00.380.1															600* 50					79.00.282.1																									355									
300*100					79.00.392.1															600* 80					79.00.294.1																									405									
300*150					79.00.402.1					30.72.381.1					30.73.381.1					30.89.316.1					600*100					79.00.306.1																				455									
300*200					79.00.460.1					30.72.394.1					30.73.394.1					30.89.327.1					600*150					79.00.316.1																													
300*250					79.00.476.1					30.72.403.1					30.73.403.1					30.89.349.1					600*200					79.00.111.1																													
350* 50					79.00.369.1															600*250					79.00.118.1					30.72.809.1					30.73.809.1																								
350* 80					79.00.381.1															600*300					79.00.124.1					30.72.829.1					30.73.829.1																								
350*100					79.00.393.1															600*350					79.00.129.1					30.72.849.1					30.73.849.1																								
350*150					79.00.403.1					30.72.412.1					30.73.412.1					30.89.378.1					600*400					79.00.133.1					30.72.894.1					30.73.894.1																			
350*200					79.00.462.1					30.72.421.1					30.73.421.1					30.89.389.1					600*450					79.00.254.1					30.72.911.1					30.73.911.1					30.89.938.1														
350*250					79.00.478.1					30.72.433.1					30.73.433.1					30.89.414.1					600*500					79.00.260.1					30.72.941.1					30.73.941.1					30.89.962.1														
350*300					79.00.492.1					30.72.443.1					30.73.443.1					30.89.440.1																																							

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.00.253.1	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.00.254.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.00.254.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.00.253.1	
GASKET, SPIRAL WOUND	4	85.41.46.404.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.602.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.00.253.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.00.253.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.00.253.1	
GASKET, SPIRAL WOUND	4	85.41.46.404.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, SPIRAL WOUND	1	85.41.46.412.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, SPIRAL WOUND	1	85.41.46.412.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GLOBE VALVE FLG. BELLOWS SEAL.	1	77.30.20.553.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.602.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GLOBE VALVE FLG. BELLOWS SEAL.	1	77.30.20.554.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.604.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GLOBE VALVE FLG. BELLOWS SEAL.	1	77.30.20.554.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	

CLASS 31310

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-15	0	50	100	150	200

	PRESSURE BAR GA					
DN15 -300	35.0	35.0	34.0	31.0	29.0	28.0

- NOTES
-
- DESIGN LIMITS ACC.TO PLUG VALVE RATING
 - FOR REQUIREMENTS REGARDING HYDROGEN FLUORIDE SERVICE, SEE DEP 31.38.01.11-GEN
 - ALL WELDS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN AND DEP 31.38.01.31-GEN
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - DN15-20 PIPING COMPONENTS ONLY TO BE USED FOR SHORT BRANCHES E.G. PRESSURE POINTS

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE										
	15	20	25	40	50	80	100	150	200	250	300
300	C	C	C	C	E	E	E	E	E	E	A
250	C	C	C	C	E	E	E	E	E	E	A
200	C	C	C	C	E	E	E	E	E	A	
150	C	C	C	C	D	D	D	D	A		
100	C	C	C	C	D	D	D	A			
80	C	C	C	C	D	A					
50	C	C	C	B	A						
40	C	B	B	A							
25	B	B	A								
20	B	A									
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	80
80	80
100	80
150	80
200	40
250	40
300	40

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR PWHT	PLANT :	
CLASS NO. : 31310	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 31310, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE PIPE DN 15-300 ASTM A333-6

* FLANGES

BLFL BLIND FLANGE DN 15-300 ASTM A350-LF2
COFL COVER FLANGE THERMOWELL NOZZLE --- ASTM A350-LF2
LJFL LAP-JOINT FLANGE --- ASTM A350-LF2
WNFL WELDING NECK FLANGE DN 15-300 ASTM A350-LF2

* FITTINGS

CAPB CAP BUTT-WELD.END DN 15-300 ASTM A420-WPL6
E45B ELBOW 45 DEG BUTT-WELD ENDS DN 15-300 ASTM A420-WPL6
E90B ELBOW 90 DEG BUTT-WELD ENDS DN 15-300 ASTM A420-WPL6
TEEB EQUAL TEE BUTT-WELD ENDS DN 15-300 ASTM A420-WPL6

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET DN 15- 50 ASTM A350-LF2
BNIP BRANCH FITTING PLAIN-END OUTL. DN 15- 50 ASTM A350-LF2
BROB BRANCH OUTLET RED. BUTT WELD DN 80-300 ASTM A350-LF2
RECB REDUCER CONC BUTT WELD ENDS DN 20-300 ASTM A420-WPL6
REEB REDUCER ECC BUTT WELD ENDS DN 20-300 ASTM A420-WPL6
TERB TEE REDUCING BUTT WELD ENDS DN 20-300 ASTM A420-WPL6

* VALVES

CHVF CHECK VALVE FLANGED DN 15-300 BODY: ASTM A352-LCB/C,A350-LF2
TRIM: MONEL 400
GAVF GATE VALVE FLANGED DN 50-300 BODY: ASTM A352-LCB/C,A350-LF2
TRIM: MONEL 400
GLVF GLOBE VALVE FLANGED DN 15-300 BODY: ASTM A352-LCB/C,A350-LF2
TRIM: MONEL 400
PLVF PLUG VALVE FLANGED DN 15-300 BODY: MONEL 400 UNS N04400
TRIM: MONEL 400/PTFE

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND DN 15-300 MONEL 400,PTFE FILLED
CS CENTRING/PTFE INNER RING
STBT STUD BOLT WITH NUTS --- ASTM A193-B7M/A194-2HM
TWSG THERMOWELL STRAIGHT DN 40- 40 ASTM B564 UNS N04400

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 31310, REV.O PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE										
		15	20	25	40	50	80	100	150	200	250	300

* PIPE												
PIPE	74.30.17	023.1	030.1	038.1	054.1	061.1	069.1	077.1	086.1	095.1	107.1	119.1
* FLANGES												
BLIND FLANGE	76.62.12	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1
WELDING NECK FLANGE	76.62.82	852.1	854.1	856.1	858.1	812.1	814.1	816.1	818.1	768.1	770.1	772.1
* FITTINGS												
CAP BUTT-WELD.END	76.31.18	172.1	178.1	182.1	192.1	210.1	230.1	248.1	268.1	284.1	306.1	328.1
ELBOW 45 DEG BUTT-WELD ENDS	76.31.38	172.1	178.1	182.1	192.1	210.1	230.1	248.1	268.1	284.1	306.1	328.1
ELBOW 90 DEG BUTT-WELD ENDS	76.31.39	172.1	178.1	182.1	192.1	210.1	230.1	248.1	268.1	284.1	306.1	328.1
EQUAL TEE BUTT-WELD ENDS	76.31.84	172.1	178.1	182.1	192.1	210.1	230.1	248.1	268.1	284.1	306.1	328.1
* VALVES												
CHECK VALVE FLANGED	77.10.46	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED	77.20.46					058.1	060.1	062.1	064.1	065.1	066.1	067.1
GLOBE VALVE FLANGED	77.30.46	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
PLUG VALVE FLANGED	77.72.62	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
* MISCELLANEOUS												
GASKET, SPIRAL WOUND	85.43.44	704.1	706.1	708.1	712.1	714.1	718.1	620.1	624.1	626.1	628.1	630.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		31.70.141.1	31.71.141.1	31.85.039.1
25* 15		31.70.151.1	31.71.151.1	31.85.049.1
25* 20		31.70.161.1	31.71.161.1	31.85.059.1
40* 15		31.70.171.1	31.71.171.1	31.85.069.1
40* 20		31.70.181.1	31.71.181.1	31.85.079.1
40* 25		31.70.191.1	31.71.191.1	31.85.089.1
50* 20		29.44.193.1	29.59.193.1	31.85.102.1
50* 25		31.70.199.1	31.71.199.1	31.85.111.1
50* 40		31.70.208.1	31.71.208.1	31.85.120.1
80* 40		31.70.229.1	31.71.229.1	31.85.129.1
80* 50	79.05.360.1	31.70.237.1	31.71.237.1	31.85.133.1
100* 40		31.70.253.1	31.71.253.1	31.85.147.1
100* 50	79.05.362.1	31.70.267.1	31.71.267.1	31.85.154.1
100* 80	79.05.386.1	31.70.277.1	31.71.277.1	31.85.166.1
150* 50	79.05.364.1			
150* 80	79.05.388.1	31.70.297.1	31.71.297.1	31.85.178.1
150*100	79.05.410.1	31.70.307.1	31.71.307.1	31.85.190.1
200* 50	79.05.066.1			
200* 80	79.05.090.1			
200*100	79.05.112.1	31.70.326.1	31.71.326.1	31.85.212.1
200*150	79.05.132.1	31.70.336.1	31.71.336.1	31.85.232.1
250* 50	79.05.068.1			
250* 80	79.05.092.1			
250*100	79.05.114.1	31.70.344.1	31.71.344.1	31.85.261.1
250*150	79.05.134.1	31.70.356.1	31.71.356.1	31.85.278.1
250*200	79.04.902.1	31.70.365.1	31.71.365.1	31.85.291.1
300* 50	79.05.070.1			
300* 80	79.05.094.1			
300*100	79.05.116.1			
300*150	79.05.136.1	31.70.384.1	31.71.384.1	31.85.317.1
300*200	79.04.904.1	31.70.396.1	31.71.396.1	31.85.328.1
300*250	79.04.920.1	31.70.404.1	31.71.404.1	31.85.350.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-300	621.1	116.1
20	40-300	623.1	118.1
25	40-100	625.1	120.1
	150-300	626.1	124.1
40	50-100	630.1	126.1
	150-300	631.1	128.1

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.151.1
255	76.83.37.152.1
305	76.83.37.153.1
355	76.83.37.155.1
405	76.83.37.156.1
455	76.83.37.157.1

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

81.38					
DN	NR	INCH	*	MM	
15	4	1/2	*	70	66.155.1
20	4	5/8	*	80	66.269.1
25	4	5/8	*	80	66.269.1
40	4	3/4	*	90	66.327.1
50	8	5/8	*	90	66.271.1
80	8	3/4	*	110	66.330.1
100	8	3/4	*	120	66.332.1
150	12	3/4	*	130	66.334.1
200	12	7/8	*	140	66.404.1
250	16	1	*	160	66.472.1
300	16	1 1/8	*	170	66.532.1

ASSEMBLIES

* PRESSURE INSTR.CONN. DN 15 FIG.4I DN 15 - 25					
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)					
GASKET, SPIRAL WOUND	2	85.43.44.704.1			
LAP-JOINT FLANGE	1	76.62.20.808.1			
PLUG VALVE FLANGED	1	77.72.62.053.1			
STUD BOLT WITH NUTS	4	81.38.66.155.1			
	4	81.38.66.155.1			
WELDING NECK FLANGE	1	76.62.82.852.1			
* PRESSURE INSTR.CONN. DN 15 FIG.4H DN 40 -300					
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)					
GASKET, SPIRAL WOUND	2	85.43.44.704.1			
LAP-JOINT FLANGE	1	76.62.20.808.1			
PLUG VALVE FLANGED	1	77.72.62.053.1			
STUD BOLT WITH NUTS	4	81.38.66.155.1			
	4	81.38.66.155.1			

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100					
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)					
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1			
GASKET, SPIRAL WOUND	1	85.43.44.712.1			
STUD BOLT WITH NUTS	4	81.38.66.330.1			
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.151.1			
* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300					
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)					
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.533.1			
GASKET, SPIRAL WOUND	1	85.43.44.712.1			
STUD BOLT WITH NUTS	4	81.38.66.330.1			
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.152.1			

CLASS 31372

DESIGN LIMITS								
TEMPERATURE IN DEGREES CELSIUS								
	0	50	75	100	125	150	175	200

	PRESSURE BAR GA							
DN15 -80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY BS5351 BALL VALVE RATING
- WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES															TABLE OF SCHEDULES	
BRANCHSIZE															DN	SCHEDULE
RUN SIZE	15	20	25	40	50	80	100	150	200	250	300	350	400	450		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A
150	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A
100	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A
80	C	C	C	C	D	D	D	D	D	D	D	D	D	D	D	A
50	C	C	C	B	B	B	B	B	B	B	B	B	B	B	B	A
40	C	B	B	B	A	A	A	A	A	A	A	A	A	A	A	A
25	B	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A
20	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
15	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT	PLANT	:	
CLASS NO. : 31372		CONSIGNEE	:	
ANS RATING : CLASS 300		ENGINEERED BY :		
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO. :		
REV. DATE : 12/96		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 31372, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC TRIM: AISI 316 (L) ,PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

31372, REV.A PAGE 3

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE			40	50	80	100	150	200	250	300	350	400	450	500	600
		15	20	25													

* PIPE																	
PIPE	74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	431.1	483.1	533.1	583.1
* FLANGES																	
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE	76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE	76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	098.1	118.1	135.1	155.1	178.1	197.1	218.1	240.1	260.1	280.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.08	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1						
CHECK VALVE FLANGED	77.10.12	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED	77.20.36								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED	77.30.12	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN	76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET	76.62.96					190.1	192.1	094.1	096.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1
STRAINER Y-TYPE	76.83.19					376.1	378.1	380.1	382.1	384.1	386.1	388.1	390.1	392.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.074.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.098.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.120.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.140.1	29.46.754.1	29.61.754.1	30.89.469.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.00.908.1	30.72.453.1	30.73.453.1	30.89.479.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.00.924.1	30.72.462.1	30.73.462.1	30.89.505.1
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*300	79.00.938.1	30.72.474.1	30.73.474.1	30.89.531.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	400*350	79.00.950.1	30.72.487.1	30.73.487.1	30.89.556.1
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 50	79.01.076.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.100.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.122.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.142.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.00.910.1	30.72.503.1	30.73.503.1	30.89.580.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.00.926.1	30.72.523.1	30.73.523.1	30.89.604.1
150* 50	79.01.364.1				450*300	79.00.940.1	30.72.553.1	30.73.553.1	30.89.628.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.00.952.1	30.72.584.1	30.73.584.1	30.89.652.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.00.962.1	30.72.614.1	30.73.614.1	30.89.676.1
200* 50	79.01.066.1				500* 50	79.01.078.1			
200* 80	79.01.090.1				500* 80	79.01.102.1			
200*100	79.01.112.1	30.72.326.1	30.73.326.1	30.89.212.1	500*100	79.01.124.1			
200*150	79.01.132.1	30.72.336.1	30.73.336.1	30.89.232.1	500*150	79.01.144.1			
250* 50	79.01.068.1				500*200	79.00.912.1	29.46.902.1	29.61.902.1	30.89.700.1
250* 80	79.01.092.1				500*250	79.00.928.1	30.72.635.1	30.73.635.1	30.89.724.1
250*100	79.01.114.1	29.46.344.1	29.61.344.1	30.89.260.1	500*300	79.00.942.1	30.72.643.1	30.73.643.1	30.89.748.1
250*150	79.01.134.1	30.72.356.1	30.73.356.1	30.89.278.1	500*350	79.00.954.1	30.72.674.1	30.73.674.1	30.89.772.1
250*200	79.00.902.1	30.72.365.1	30.73.365.1	30.89.291.1	500*400	79.00.964.1	30.72.704.1	30.73.704.1	30.89.796.1
300* 50	79.01.070.1				500*450	79.00.972.1	30.72.734.1	30.73.734.1	30.89.820.1
300* 80	79.01.094.1				600* 50	79.01.082.1			
300*100	79.01.116.1				600* 80	79.01.106.1			
300*150	79.01.136.1	30.72.380.1	30.73.380.1	30.89.317.1	600*100	79.01.128.1			
300*200	79.00.904.1	30.72.396.1	30.73.396.1	30.89.328.1	600*150	79.01.148.1			
300*250	79.00.920.1	30.72.404.1	30.73.404.1	30.89.350.1	600*200	79.00.916.1			
350* 50	79.01.072.1				600*250	79.00.932.1	30.72.803.1	30.73.803.1	30.89.844.1
350* 80	79.01.096.1				600*300	79.00.946.1	30.72.823.1	30.73.823.1	30.89.868.1
350*100	79.01.118.1				600*350	79.00.958.1	30.72.843.1	30.73.843.1	30.89.892.1
350*150	79.01.138.1	29.46.604.1	29.61.604.1	30.89.379.1	600*400	79.00.968.1	30.72.884.1	30.73.884.1	30.89.916.1
350*200	79.00.906.1	30.72.422.1	30.73.422.1	30.89.390.1	600*450	79.00.976.1	30.72.914.1	30.73.914.1	30.89.940.1
350*250	79.00.922.1	30.72.438.1	30.73.438.1	30.89.415.1	600*500	79.00.982.1	30.72.944.1	30.73.944.1	30.89.964.1
350*300	79.00.936.1	30.72.447.1	30.73.447.1	30.89.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	121.1	016.1
20	40-600	123.1	018.1
25	40-100	125.1	020.1
	150-600	126.1	024.1
40	50-100	130.1	026.1
	150-600	131.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.59.062.1			230 76.83.37.101.1
813	76.80.59.064.1			255 76.83.37.102.1
1219	76.80.59.066.1			305 76.83.37.103.1
1524	76.80.59.068.1			355 76.83.37.105.1
1829	76.80.59.070.1			405 76.83.37.106.1
2134	76.80.59.072.1			455 76.83.37.107.1
2438	76.80.59.074.1			
2743	76.80.59.076.1			
3048	76.80.59.078.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* DRAIN POINT	DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.104.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.654.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.104.1	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
	8	81.38.61.155.1	
WELDING NECK FLANGE	2	76.62.78.652.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.00.08.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.00.08.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.30.12.053.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.62.78.652.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.12.054.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	
WELDING NECK FLANGE	1	76.62.78.654.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.30.12.054.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	

CLASS 31373

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	50.0	49.0	48.0	46.3	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0
DN200-600	31.0	31.0	31.0	29.0	23.0	18.0	12.0	7.0

NOTES

- -----
 - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1,
 AND LIMITED BY BS5351 BALL VALVE RATING
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	A					50	80
300	C	C	C	C	E	E	E	E	E	E	A						80	80
250	C	C	C	C	E	E	E	E	E	A							100	80
200	C	C	C	C	E	E	E	E	A								150	80
150	C	C	C	C	D	D	D	A									200	40
100	C	C	C	C	D	D	A										250	40
80	C	C	C	C	D	A											300	40
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

CODE EXPLANATION OF CHARACTERS

 A EQUAL TEE
 B REDUCING TEE
 C BRANCH FITTING
 D PIPE TO PIPE
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 31373	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,PTFE
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE	74.30.05	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	431.1	483.1	533.1	583.1

* FLANGES																	
BLIND FLANGE	76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1
SPECTACLE BLIND FLANGE	76.88.03	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE	76.62.78	652.1	654.1	656.1	658.1	610.1	612.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1

* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	058.1	078.1	098.1	118.1	135.1	155.1	178.1	197.1	218.1	240.1	260.1	280.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	608.1	628.1	648.1	668.1	685.1	705.1	728.1	747.1	768.1	790.1	810.1	830.1

* VALVES																	
BALL VALVE RED. BORE FLANGED	77.00.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1						
CHECK VALVE FLANGED	77.10.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED	77.20.04								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED	77.30.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							

* MISCELLANEOUS																	
GASKET, RF TANGED INSERT	85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN	76.65.96	262.1	264.1	266.1	268.1												
ORIFICE FLANGE SET	76.62.95					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	584.1
STRAINER Y-TYPE	76.83.19					476.1	478.1	480.1	482.1	484.1	486.1	488.1	490.1	492.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.01.074.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.098.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.120.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.140.1	29.46.754.1	29.61.754.1	30.89.469.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.00.908.1	30.72.453.1	30.73.453.1	30.89.479.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.00.924.1	30.72.462.1	30.73.462.1	30.89.505.1
50* 20		29.46.193.1	29.61.193.1	30.89.102.1	400*300	79.00.938.1	30.72.474.1	30.73.474.1	30.89.531.1
50* 25		30.72.199.1	30.73.199.1	30.89.111.1	400*350	79.00.950.1	30.72.487.1	30.73.487.1	30.89.556.1
50* 40		30.72.208.1	30.73.208.1	30.89.120.1	450* 50	79.01.076.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.100.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.122.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.142.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.00.910.1	30.72.503.1	30.73.503.1	30.89.580.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.00.926.1	30.72.523.1	30.73.523.1	30.89.604.1
150* 50	79.01.364.1				450*300	79.00.940.1	30.72.553.1	30.73.553.1	30.89.628.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.00.952.1	30.72.584.1	30.73.584.1	30.89.652.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.00.962.1	30.72.614.1	30.73.614.1	30.89.676.1
200* 50	79.01.066.1				500* 50	79.01.078.1			
200* 80	79.01.090.1				500* 80	79.01.102.1			
200*100	79.01.112.1	30.72.326.1	30.73.326.1	30.89.212.1	500*100	79.01.124.1			
200*150	79.01.132.1	30.72.336.1	30.73.336.1	30.89.232.1	500*150	79.01.144.1			
250* 50	79.01.068.1				500*200	79.00.912.1	29.46.902.1	29.61.902.1	30.89.700.1
250* 80	79.01.092.1				500*250	79.00.928.1	30.72.635.1	30.73.635.1	30.89.724.1
250*100	79.01.114.1	29.46.344.1	29.61.344.1	30.89.260.1	500*300	79.00.942.1	30.72.643.1	30.73.643.1	30.89.748.1
250*150	79.01.134.1	30.72.356.1	30.73.356.1	30.89.278.1	500*350	79.00.954.1	30.72.674.1	30.73.674.1	30.89.772.1
250*200	79.00.902.1	30.72.365.1	30.73.365.1	30.89.291.1	500*400	79.00.964.1	30.72.704.1	30.73.704.1	30.89.796.1
300* 50	79.01.070.1				500*450	79.00.972.1	30.72.734.1	30.73.734.1	30.89.820.1
300* 80	79.01.094.1				600* 50	79.01.082.1			
300*100	79.01.116.1				600* 80	79.01.106.1			
300*150	79.01.136.1	30.72.380.1	30.73.380.1	30.89.317.1	600*100	79.01.128.1			
300*200	79.00.904.1	30.72.396.1	30.73.396.1	30.89.328.1	600*150	79.01.148.1			
300*250	79.00.920.1	30.72.404.1	30.73.404.1	30.89.350.1	600*200	79.00.916.1			
350* 50	79.01.072.1				600*250	79.00.932.1	30.72.803.1	30.73.803.1	30.89.844.1
350* 80	79.01.096.1				600*300	79.00.946.1	30.72.823.1	30.73.823.1	30.89.868.1
350*100	79.01.118.1				600*350	79.00.958.1	30.72.843.1	30.73.843.1	30.89.892.1
350*150	79.01.138.1	29.46.604.1	29.61.604.1	30.89.379.1	600*400	79.00.968.1	30.72.884.1	30.73.884.1	30.89.916.1
350*200	79.00.906.1	30.72.422.1	30.73.422.1	30.89.390.1	600*450	79.00.976.1	30.72.914.1	30.73.914.1	30.89.940.1
350*250	79.00.922.1	30.72.438.1	30.73.438.1	30.89.415.1	600*500	79.00.982.1	30.72.944.1	30.73.944.1	30.89.964.1
350*300	79.00.936.1	30.72.447.1	30.73.447.1	30.89.441.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	121.1	016.1
20	40-600	123.1	018.1
25	40-100	125.1	020.1
	150-600	126.1	024.1
40	50-100	130.1	026.1
	150-600	131.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.062.1			230 76.83.37.101.1
813	76.80.60.064.1			255 76.83.37.102.1
1219	76.80.60.066.1			305 76.83.37.103.1
1524	76.80.60.068.1			355 76.83.37.105.1
1829	76.80.60.070.1			405 76.83.37.106.1
2134	76.80.60.072.1			455 76.83.37.107.1
2438	76.80.60.074.1			
2743	76.80.60.076.1			
3048	76.80.60.078.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT			DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.103.1	
BLIND FLANGE			1	76.62.11.108.1	
GASKET, RF TANGED INSERT			2	85.30.01.104.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	
WELDING NECK FLANGE			1	76.62.78.652.1	

* DRAIN POINT			DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.104.1	
BLIND FLANGE			1	76.62.11.112.1	
GASKET, RF TANGED INSERT			2	85.30.01.106.1	
STUD BOLT WITH NUTS			8	81.38.61.269.1	
WELDING NECK FLANGE			1	76.62.78.654.1	

* DRAIN POINT			DN 20	FIG.2H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.104.1	
BLIND FLANGE			1	76.62.11.112.1	
GASKET, RF TANGED INSERT			2	85.30.01.106.1	
STUD BOLT WITH NUTS			8	81.38.61.269.1	

* ORIFICE INSTR.CONN.			DN 15	FIG.2I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			2	77.00.03.103.1	
GASKET, RF TANGED INSERT			4	85.30.01.104.1	
LAP-JOINT FLANGE			2	76.62.20.308.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	
			8	81.38.61.155.1	
WELDING NECK FLANGE			2	76.62.78.652.1	

* PRESSURE INSTR.CONN.			DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.103.1	
GASKET, RF TANGED INSERT			2	85.30.01.104.1	
LAP-JOINT FLANGE			1	76.62.20.308.1	
STUD BOLT WITH NUTS			4	81.38.61.155.1	
			4	81.38.61.155.1	
WELDING NECK FLANGE			1	76.62.78.652.1	

* PRESSURE INSTR.CONN.			DN 15	FIG.2H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			1	77.00.03.103.1	
GASKET, RF TANGED INSERT			2	85.30.01.104.1	
LAP-JOINT FLANGE			1	76.62.20.308.1	
STUD BOLT WITH NUTS			4	81.38.61.155.1	
			4	81.38.61.155.1	

* METERRUN INSTR. CONN			DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED			2	77.00.03.103.1	
GASKET, RF TANGED INSERT			4	85.30.01.104.1	
LAP-JOINT FLANGE			2	76.62.20.308.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	
			8	81.38.61.155.1	

* TEMPERATURE INSTR.C.			DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE			1	76.62.60.533.1	
GASKET, RF TANGED INSERT			1	85.30.01.112.1	
STUD BOLT WITH NUTS			4	81.38.61.330.1	
THERMOWELL STRAIGHT			L=230 MM	1	76.83.37.101.1

* TEMPERATURE INSTR.C.			DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE			1	76.62.60.533.1	
GASKET, RF TANGED INSERT			1	85.30.01.112.1	
STUD BOLT WITH NUTS			4	81.38.61.330.1	
THERMOWELL STRAIGHT			L=255 MM	1	76.83.37.102.1

* VENT POINT			DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.108.1	
GASKET, RF TANGED INSERT			2	85.30.01.104.1	
GLOBE VALVE FLANGED			1	77.30.05.053.1	
STUD BOLT WITH NUTS			8	81.38.61.155.1	
WELDING NECK FLANGE			1	76.62.78.652.1	

* VENT POINT			DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.112.1	
GASKET, RF TANGED INSERT			2	85.30.01.106.1	
GLOBE VALVE FLANGED			1	77.30.05.054.1	
STUD BOLT WITH NUTS			8	81.38.61.269.1	
WELDING NECK FLANGE			1	76.62.78.654.1	

* VENT POINT			DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)			1	(PIPING COMP.)	
BLIND FLANGE			1	76.62.11.112.1	
GASKET, RF TANGED INSERT			2	85.30.01.106.1	
GLOBE VALVE FLANGED			1	77.30.05.054.1	
STUD BOLT WITH NUTS			8	81.38.61.269.1	

CLASS 32010

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	450
PRESSURE BAR GA										
DN15 -600	51.7	51.7	51.4	49.6	48.0	46.2	42.8	40.3	36.4	33.7

- NOTES
- - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	40
300	C	C	C	C	E	E	E	E	E	E	E						80	40
250	C	C	C	C	E	E	E	E	E	E	A						100	40
200	C	C	C	C	E	E	E	E	E	A							150	40
150	C	C	C	C	E	E	E	A									200	40
100	C	C	C	C	D	D	A										250	40
80	C	C	C	C	D	A											300	40
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 32010	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 32010, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-1.25CR CLASS 22
		DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A335-P11
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.11	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	095.1	107.1	119.1	131.1	141.1	451.1	461.1	481.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.64.10	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPECTACLE BLIND FLANGE		76.88.07	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1	284.1	286.1	288.1	290.1	294.1
WELDING NECK FLANGE		76.64.79	186.1	188.1	190.1	192.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	415.1	425.1	435.1	445.1	455.1	465.1	475.1	485.1	495.1	505.1	515.1	535.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
* VALVES																		
CHECK VALVE FLANGED		77.13.60	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.23.60	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.33.60	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.64.95	122.1	124.1	126.1	128.1												
ORIFICE FLANGE SET		76.64.91					274.1	276.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
STRAINER Y-TYPE		76.83.20					252.1	254.1	256.1	258.1	261.1	263.1	265.1	267.1	268.1			

BROB	RECB	REEB	TERB	BROB	RECB	REEB
76.	76.	76.	76.	76.	76.	76.
RUN* BR						
20* 15	32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.24.824.1	
25* 15	32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.24.848.1	
25* 20	32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.24.870.1	
40* 15	32.68.032.1	32.69.032.1		400*150	79.24.890.1	32.68.347.1 32.69.347.1
40* 20	32.68.042.1	32.69.042.1		400*200	79.24.908.1	32.68.351.1 32.69.351.1
40* 25	32.68.052.1	32.69.052.1		400*250	79.24.924.1	32.68.361.1 32.69.361.1
50* 20	32.68.069.1	32.69.069.1		400*300	79.24.938.1	32.68.371.1 32.69.371.1
50* 25	32.68.075.1	32.69.075.1		400*350	79.24.950.1	32.68.381.1 32.69.381.1
50* 40	32.68.085.1	32.69.085.1		450* 50	79.24.826.1	
80* 40	32.68.095.1	32.69.095.1		450* 80	79.24.850.1	
80* 50	79.24.810.1	32.68.101.1	32.69.101.1	450*100	79.24.872.1	
100* 40		32.68.119.1	32.69.119.1	450*150	79.24.892.1	
100* 50	79.24.812.1	32.68.125.1	32.69.125.1	450*200	79.24.910.1	32.68.351.1 32.69.351.1
100* 80	79.24.836.1	32.68.140.1	32.69.140.1	450*250	79.24.926.1	32.68.391.1 32.69.391.1
150* 50	79.24.814.1			450*300	79.24.940.1	32.68.401.1 32.69.401.1
150* 80	79.24.838.1	32.68.155.1	32.69.155.1	450*350	79.24.952.1	32.68.411.1 32.69.411.1
150*100	79.24.860.1	32.68.170.1	32.69.170.1	450*400	79.24.962.1	32.68.421.1 32.69.421.1
200* 50	79.24.816.1			500* 50	79.24.828.1	
200* 80	79.24.840.1			500* 80	79.24.852.1	
200*100	79.24.862.1	32.68.190.1	32.69.190.1	500*100	79.24.874.1	
200*150	79.24.882.1	32.68.215.1	32.69.215.1	500*150	79.24.896.1	
250* 50	79.24.818.1			500*200	79.24.912.1	32.68.429.1 32.69.429.1
250* 80	79.24.842.1			500*250	79.24.928.1	32.68.438.1 32.69.438.1
250*100	79.24.864.1	32.68.240.1	32.69.240.1	500*300	79.24.942.1	32.68.431.1 32.69.431.1
250*150	79.24.884.1	32.68.255.1	32.69.255.1	500*350	79.24.954.1	32.68.441.1 32.69.441.1
250*200	79.24.902.1	32.68.271.1	32.69.271.1	500*400	79.24.964.1	32.68.451.1 32.69.451.1
300* 50	79.24.820.1			500*450	79.24.972.1	32.68.461.1 32.69.461.1
300* 80	79.24.844.1			600* 50	79.24.832.1	
300*100	79.24.866.1			600* 80	79.24.856.1	
300*150	79.24.886.1	32.68.281.1	32.69.281.1	600*100	79.24.878.1	
300*200	79.24.904.1	32.68.291.1	32.69.291.1	600*150	79.24.898.1	
300*250	79.24.920.1	32.68.301.1	32.69.301.1	600*200	79.24.916.1	
350* 50	79.24.822.1			600*250	79.24.932.1	32.68.465.1 32.69.465.1
350* 80	79.24.846.1			600*300	79.24.946.1	32.68.468.1 32.69.468.1
350*100	79.24.868.1			600*350	79.24.958.1	32.68.485.1 32.69.485.1
350*150	79.24.888.1	32.68.311.1	32.69.311.1	600*400	79.24.968.1	32.68.471.1 32.69.471.1
350*200	79.24.906.1	32.68.321.1	32.69.321.1	600*450	79.24.976.1	32.68.481.1 32.69.481.1
350*250	79.24.922.1	32.68.331.1	32.69.331.1	600*500	79.24.982.1	32.68.491.1 32.69.491.1
350*300	79.24.936.1	32.68.341.1	32.69.341.1			

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.38	76.80.31
15	40-150	341.1	181.1
	200-600	342.1	182.1
20	40- 80	343.1	183.1
	100-600	344.1	184.1
25	40- 40	345.1	185.1
	50- 50	346.1	186.1
	80-100	347.1	187.1
	150-600	348.1	188.1
40	50- 50	350.1	189.1
	80- 80	351.1	190.1
	100-100	352.1	191.1
	150-300	353.1	193.1
	350-600	354.1	194.1

LEVEL	DISPLACER	CHAMBER	THERMOWELL
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.60.802.1	230	76.83.37.101.1
813	76.80.60.804.1	255	76.83.37.102.1
1219	76.80.60.806.1	305	76.83.37.103.1
1524	76.80.60.808.1	355	76.83.37.105.1
1829	76.80.60.810.1	405	76.83.37.106.1
2134	76.80.60.812.1	455	76.83.37.107.1
2438	76.80.60.814.1		
2743	76.80.60.816.1		
3048	76.80.60.818.1		

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 70	15	4	1/2	* 70
20	4	5/8	* 80	20	4	5/8	* 80
25	4	5/8	* 80	25	4	5/8	* 90
40	4	3/4	* 90	40	4	3/4	* 100
50	8	5/8	* 90				
80	8	3/4	* 110				
100	8	3/4	* 120				
150	12	3/4	* 130				
200	12	7/8	* 140				
250	16	1	* 160				
300	16	1 1/8	* 170				
350	20	1 1/8	* 180				
400	20	1 1/4	* 190				
450	24	1 1/4	* 200				
500	24	1 1/4	* 210				
600	24	1 1/2	* 240				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 80
				20	4	5/8	* 90
				25	4	5/8	* 90
				40	4	3/4	* 100
50	8	5/8	* 150	50	8	5/8	* 100
80	8	3/4	* 150	80	8	3/4	* 120
100	12	3/4	* 140	100	8	3/4	* 130
150	12	3/4	* 140	150	12	3/4	* 150
200	12	7/8	* 150	200	12	7/8	* 170
250	16	1	* 170	250	16	1	* 190
300	16	1 1/8	* 190	300	16	1 1/8	* 210
350	20	1 1/8	* 200	350	20	1 1/8	* 220
400	20	1 1/4	* 210	400	20	1 1/4	* 240
450	24	1 1/4	* 220	450	24	1 1/4	* 250
500	24	1 1/4	* 230	500	24	1 1/4	* 260
600	24	1 1/2	* 260	600	24	1 1/2	* 300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.23.60.053.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GATE VALVE FLANGED	1	77.23.60.054.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	
WELDING NECK FLANGE	1	76.64.79.188.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GATE VALVE FLANGED	1	77.23.60.054.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.23.60.053.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
	8	81.38.96.155.1	
WELDING NECK FLANGE	2	76.64.79.186.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.23.60.053.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.155.1	
	4	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.1H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.33.60.053.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.96.155.1	
	4	81.38.96.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.23.60.053.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
	8	81.38.96.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.983.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.983.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.33.60.053.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.33.60.054.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	
WELDING NECK FLANGE	1	76.64.79.188.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.33.60.054.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	

CLASS 32020

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -600	51.7	51.7	51.4	49.6	48.0	46.2	42.8	40.3	36.4	33.7

NOTES

- -----
 - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	40
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E		80	40
250	C	C	C	C	E	E	E	E	E	E	A						100	40
200	C	C	C	C	E	E	E	E	E	A							150	40
150	C	C	C	C	E	E	E	E	A								200	40
100	C	C	C	C	D	D	A										250	40
80	C	C	C	C	D	A											300	40
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 32020	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
		DN450-600	ASTM A691-1.25CR CLASS 22
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	---	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GABB	GATE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GLBB	GLOBE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.11	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	095.1	107.1	119.1	131.1	141.1	451.1	461.1	481.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.64.10	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPECTACLE BLIND FLANGE		76.88.07	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1	284.1	286.1	288.1	290.1	294.1
WELDING NECK FLANGE		76.64.79	186.1	188.1	190.1	192.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	415.1	425.1	435.1	445.1	455.1	465.1	475.1	485.1	495.1	505.1	515.1	535.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
* VALVES																		
CHECK VALVE FLANGED		77.13.64	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE BW BELLOWS SEALED		77.24.64	803.1	804.1	805.1	807.1												
GATE VALVE FLANGED		77.23.64	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE BW BELLOWS SEALED		77.34.64	803.1	804.1	805.1	807.1												
GLOBE VALVE FLANGED		77.33.64	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	404.1	406.1	408.1	412.1	414.1	418.1	370.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1	388.1	392.1
METER RUN		76.64.95	122.1	124.1	126.1	128.1												
ORIFICE FLANGE SET		76.64.91					274.1	276.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
STRAINER Y-TYPE		76.83.20					252.1	254.1	256.1	258.1	261.1	263.1	265.1	267.1	268.1			

								BNIP		
					BROB	RECB	REEB	76.80.31		
					76.	76.	76.			
RUN* BR								BRANCH	RUN-PIPE	
20* 15		32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.24.824.1		15	40-150	181.1
25* 15		32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.24.848.1			200-600	182.1
25* 20		32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.24.870.1		20	40- 80	183.1
40* 15		32.68.032.1	32.69.032.1		400*150	79.24.890.1	32.68.347.1		100-600	184.1
40* 20		32.68.042.1	32.69.042.1		400*200	79.24.908.1	32.68.351.1	25	40- 40	185.1
40* 25		32.68.052.1	32.69.052.1		400*250	79.24.924.1	32.68.361.1		50- 50	186.1
50* 20		32.68.069.1	32.69.069.1		400*300	79.24.938.1	32.68.371.1		80-100	187.1
50* 25		32.68.075.1	32.69.075.1		400*350	79.24.950.1	32.68.381.1		150-600	188.1
50* 40		32.68.085.1	32.69.085.1		450* 50	79.24.826.1		40	50- 50	189.1
80* 40		32.68.095.1	32.69.095.1		450* 80	79.24.850.1			80- 80	190.1
80* 50	79.24.810.1	32.68.101.1	32.69.101.1		450*100	79.24.872.1			100-100	191.1
100* 40		32.68.119.1	32.69.119.1		450*150	79.24.892.1			150-300	193.1
100* 50	79.24.812.1	32.68.125.1	32.69.125.1		450*200	79.24.910.1	32.68.351.1		350-600	194.1
100* 80	79.24.836.1	32.68.140.1	32.69.140.1		450*250	79.24.926.1	32.68.391.1			
150* 50	79.24.814.1				450*300	79.24.940.1	32.68.401.1			
150* 80	79.24.838.1	32.68.155.1	32.69.155.1		450*350	79.24.952.1	32.68.411.1			
150*100	79.24.860.1	32.68.170.1	32.69.170.1		450*400	79.24.962.1	32.68.421.1			
200* 50	79.24.816.1				500* 50	79.24.828.1				
200* 80	79.24.840.1				500* 80	79.24.852.1				
200*100	79.24.862.1	32.68.190.1	32.69.190.1		500*100	79.24.874.1				
200*150	79.24.882.1	32.68.215.1	32.69.215.1		500*150	79.24.896.1				
250* 50	79.24.818.1				500*200	79.24.912.1	32.68.429.1			
250* 80	79.24.842.1				500*250	79.24.928.1	32.68.438.1			
250*100	79.24.864.1	32.68.240.1	32.69.240.1		500*300	79.24.942.1	32.68.431.1			
250*150	79.24.884.1	32.68.255.1	32.69.255.1		500*350	79.24.954.1	32.68.441.1			
250*200	79.24.902.1	32.68.271.1	32.69.271.1		500*400	79.24.964.1	32.68.451.1			
300* 50	79.24.820.1				500*450	79.24.972.1	32.68.461.1			
300* 80	79.24.844.1				600* 50	79.24.832.1				
300*100	79.24.866.1				600* 80	79.24.856.1				
300*150	79.24.886.1	32.68.281.1	32.69.281.1		600*100	79.24.878.1				
300*200	79.24.904.1	32.68.291.1	32.69.291.1		600*150	79.24.898.1				
300*250	79.24.920.1	32.68.301.1	32.69.301.1		600*200	79.24.916.1				
350* 50	79.24.822.1				600*250	79.24.932.1	32.68.465.1			
350* 80	79.24.846.1				600*300	79.24.946.1	32.68.468.1			
350*100	79.24.868.1				600*350	79.24.958.1	32.68.485.1			
350*150	79.24.888.1	32.68.311.1	32.69.311.1		600*400	79.24.968.1	32.68.471.1			
350*200	79.24.906.1	32.68.321.1	32.69.321.1		600*450	79.24.976.1	32.68.481.1			
350*250	79.24.922.1	32.68.331.1	32.69.331.1		600*500	79.24.982.1	32.68.491.1			
350*300	79.24.936.1	32.68.341.1	32.69.341.1							

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 70	15	4	1/2	* 70
20	4	5/8	* 80	20	4	5/8	* 80
25	4	5/8	* 80	25	4	5/8	* 90
40	4	3/4	* 90	40	4	3/4	* 100
50	8	5/8	* 90				
80	8	3/4	* 110				
100	8	3/4	* 120				
150	12	3/4	* 130				
200	12	7/8	* 140				
250	16	1	* 160				
300	16	1 1/8	* 170				
350	20	1 1/8	* 180				
400	20	1 1/4	* 190				
450	24	1 1/4	* 200				
500	24	1 1/4	* 210				
600	24	1 1/2	* 240				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 80
				20	4	5/8	* 90
				25	4	5/8	* 90
				40	4	3/4	* 100
50	8	5/8	* 150	50	8	5/8	* 100
80	8	3/4	* 150	80	8	3/4	* 120
100	12	3/4	* 140	100	8	3/4	* 130
150	12	3/4	* 140	150	12	3/4	* 150
200	12	7/8	* 150	200	12	7/8	* 170
250	16	1	* 170	250	16	1	* 190
300	16	1 1/8	* 190	300	16	1 1/8	* 210
350	20	1 1/8	* 200	350	20	1 1/8	* 220
400	20	1 1/4	* 210	400	20	1 1/4	* 240
450	24	1 1/4	* 220	450	24	1 1/4	* 250
500	24	1 1/4	* 230	500	24	1 1/4	* 260
600	24	1 1/2	* 260	600	24	1 1/2	* 300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.108.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.64.053.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GATE VALVE FLANGED	1	77.23.64.054.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	
WELDING NECK FLANGE	1	76.64.79.188.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GATE VALVE FLANGED	1	77.23.64.054.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.404.1	
GATE VALVE FLANGED	2	77.23.64.053.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
	8	81.38.96.155.1	
WELDING NECK FLANGE	2	76.64.79.186.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.64.053.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.155.1	
	4	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.64.053.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.96.155.1	
	4	81.38.96.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.404.1	
GATE VALVE FLANGED	2	77.23.64.053.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
	8	81.38.96.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.983.1	
GASKET, SPIRAL WOUND	1	85.41.46.412.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.983.1	
GASKET, SPIRAL WOUND	1	85.41.46.412.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.108.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GLOBE VALVE FLANGED	1	77.33.64.053.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GLOBE VALVE FLANGED	1	77.33.64.054.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	
WELDING NECK FLANGE	1	76.64.79.188.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GLOBE VALVE FLANGED	1	77.33.64.054.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	

CLASS 32021

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	0	100	200	300	400	450	475	500	525	538

PRESSURE BAR GA										
DN15 -600	51.7	51.4	48.0	42.8	36.4	33.7	31.6	25.2	18.1	14.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 40
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 40
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 40
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 40
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 40
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 40
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 40
50	C	C	C	C	B	E	E	E	E	E	E	E	E	E	E	A	350 40
40	C	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	400 40
25	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	450 40
20	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	500 40
15	A	A	A	A	A	E	E	E	E	E	E	E	E	E	E	A	600 40

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 32021	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 32021, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-1.25CR CLASS 22
		DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	---	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GABB	GATE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLBB	GLOBE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-200	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 321/347,GRAPHITE FILLED SS CENTRING/INNER RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/194-8C
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.11	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	095.1	107.1	119.1	131.1	141.1	451.1	461.1	481.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.64.10	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPECTACLE BLIND FLANGE		76.88.07	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1	284.1	286.1	288.1	290.1	294.1
WELDING NECK FLANGE		76.64.79	186.1	188.1	190.1	192.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	415.1	425.1	435.1	445.1	455.1	465.1	475.1	485.1	495.1	505.1	515.1	535.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
* VALVES																		
CHECK VALVE FLANGED		77.13.64	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE BW BELLOWS SEALED		77.24.64	803.1	804.1	805.1	807.1												
GATE VALVE BUTT-WELD ENDS		77.24.64	103.1	104.1	105.1	107.1	059.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.23.64	053.1	054.1	055.1	057.1	058.1											
GLOBE VALVE BW BELLOWS SEALED		77.34.64	803.1	804.1	805.1	807.1												
GLOBE VALVE BUTT-WELD ENDS		77.34.64	103.1	104.1	105.1	107.1	059.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.45	104.1	106.1	108.1	112.1	114.1	118.1	070.1	074.1	076.1	078.1	080.1	082.1	084.1	086.1	088.1	092.1
METER RUN		76.64.95	122.1	124.1	126.1	128.1												
ORIFICE FLANGE SET		76.64.91					274.1	276.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1

BROB				BROB				BNIP		
76.				76.				76.80.31		
RUN* BR								BRANCH	RUN-PIPE	
20* 15		32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.24.824.1		15	40-150	181.1
25* 15		32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.24.848.1			200-600	182.1
25* 20		32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.24.870.1		20	40- 80	183.1
40* 15		32.68.032.1	32.69.032.1		400*150	79.24.890.1	32.68.347.1		100-600	184.1
40* 20		32.68.042.1	32.69.042.1		400*200	79.24.908.1	32.68.351.1	25	40- 40	185.1
40* 25		32.68.052.1	32.69.052.1		400*250	79.24.924.1	32.68.361.1		50- 50	186.1
50* 20		32.68.069.1	32.69.069.1		400*300	79.24.938.1	32.68.371.1		80-100	187.1
50* 25		32.68.075.1	32.69.075.1		400*350	79.24.950.1	32.68.381.1		150-600	188.1
50* 40		32.68.085.1	32.69.085.1		450* 50	79.24.826.1		40	50- 50	189.1
80* 40		32.68.095.1	32.69.095.1		450* 80	79.24.850.1			80- 80	190.1
80* 50	79.24.810.1	32.68.101.1	32.69.101.1		450*100	79.24.872.1			100-100	191.1
100* 40		32.68.119.1	32.69.119.1		450*150	79.24.892.1			150-300	193.1
100* 50	79.24.812.1	32.68.125.1	32.69.125.1		450*200	79.24.910.1	32.68.351.1		350-600	194.1
100* 80	79.24.836.1	32.68.140.1	32.69.140.1		450*250	79.24.926.1	32.68.391.1			
150* 50	79.24.814.1				450*300	79.24.940.1	32.68.401.1			
150* 80	79.24.838.1	32.68.155.1	32.69.155.1		450*350	79.24.952.1	32.68.411.1			
150*100	79.24.860.1	32.68.170.1	32.69.170.1		450*400	79.24.962.1	32.68.421.1			
200* 50	79.24.816.1				500* 50	79.24.828.1				
200* 80	79.24.840.1				500* 80	79.24.852.1				
200*100	79.24.862.1	32.68.190.1	32.69.190.1		500*100	79.24.874.1				
200*150	79.24.882.1	32.68.215.1	32.69.215.1		500*150	79.24.896.1				
250* 50	79.24.818.1				500*200	79.24.912.1	32.68.429.1			
250* 80	79.24.842.1				500*250	79.24.928.1	32.68.438.1			
250*100	79.24.864.1	32.68.240.1	32.69.240.1		500*300	79.24.942.1	32.68.431.1			
250*150	79.24.884.1	32.68.255.1	32.69.255.1		500*350	79.24.954.1	32.68.441.1			
250*200	79.24.902.1	32.68.271.1	32.69.271.1		500*400	79.24.964.1	32.68.451.1			
300* 50	79.24.820.1				500*450	79.24.972.1	32.68.461.1			
300* 80	79.24.844.1				600* 50	79.24.832.1				
300*100	79.24.866.1				600* 80	79.24.856.1				
300*150	79.24.886.1	32.68.281.1	32.69.281.1		600*100	79.24.878.1				
300*200	79.24.904.1	32.68.291.1	32.69.291.1		600*150	79.24.898.1				
300*250	79.24.920.1	32.68.301.1	32.69.301.1		600*200	79.24.916.1				
350* 50	79.24.822.1				600*250	79.24.932.1	32.68.465.1			
350* 80	79.24.846.1				600*300	79.24.946.1	32.68.468.1			
350*100	79.24.868.1				600*350	79.24.958.1	32.68.485.1			
350*150	79.24.888.1	32.68.311.1	32.69.311.1		600*400	79.24.968.1	32.68.471.1			
350*200	79.24.906.1	32.68.321.1	32.69.321.1		600*450	79.24.976.1	32.68.481.1			
350*250	79.24.922.1	32.68.331.1	32.69.331.1		600*500	79.24.982.1	32.68.491.1			
350*300	79.24.936.1	32.68.341.1	32.69.341.1							

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 70	15	4	1/2	* 70
20	4	5/8	* 80	20	4	5/8	* 80
25	4	5/8	* 80	25	4	5/8	* 90
40	4	3/4	* 90	40	4	3/4	* 100
50	8	5/8	* 90				
80	8	3/4	* 110				
100	8	3/4	* 120				
150	12	3/4	* 130				
200	12	7/8	* 140				
250	16	1	* 160				
300	16	1 1/8	* 170				
350	20	1 1/8	* 180				
400	20	1 1/4	* 190				
450	24	1 1/4	* 200				
500	24	1 1/4	* 210				
600	24	1 1/2	* 240				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 80
				20	4	5/8	* 90
				25	4	5/8	* 90
				40	4	3/4	* 100
50	8	5/8	* 150	50	8	5/8	* 100
80	8	3/4	* 150	80	8	3/4	* 120
100	12	3/4	* 140	100	8	3/4	* 130
150	12	3/4	* 140	150	12	3/4	* 150
200	12	7/8	* 150	200	12	7/8	* 170
250	16	1	* 170	250	16	1	* 190
300	16	1 1/8	* 190	300	16	1 1/8	* 210
350	20	1 1/8	* 200	350	20	1 1/8	* 220
400	20	1 1/4	* 210	400	20	1 1/4	* 240
450	24	1 1/4	* 220	450	24	1 1/4	* 250
500	24	1 1/4	* 230	500	24	1 1/4	* 260
600	24	1 1/2	* 260	600	24	1 1/2	* 300

ASSEMBLIES

* DRAIN POINT				DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.108.1	
GASKET, SPIRAL WOUND				1	85.41.45.104.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.64.103.1	
PIPE NIPPLE 50MM				1	76.32.57.431.1	
STUD BOLT WITH NUTS				4	81.38.97.155.1	
WELDING NECK FLANGE				1	76.64.79.186.1	

* DRAIN POINT				DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.112.1	
GASKET, SPIRAL WOUND				1	85.41.45.106.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.64.104.1	
PIPE NIPPLE 50MM				1	76.32.57.441.1	
STUD BOLT WITH NUTS				4	81.38.97.269.1	
WELDING NECK FLANGE				1	76.64.79.188.1	

* DRAIN POINT				DN 20	FIG.0M	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.112.1	
GASKET, SPIRAL WOUND				1	85.41.45.106.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.64.104.1	
STUD BOLT WITH NUTS				4	81.38.97.269.1	
WELDING NECK FLANGE				1	76.64.79.188.1	

* ORIFICE INSTR.CONN.				DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, SPIRAL WOUND				2	85.41.45.104.1	
GATE VALVE BUTT-WELD ENDS				2	77.24.64.103.1	
LAP-JOINT FLANGE				2	76.64.20.108.1	
STUD BOLT WITH NUTS				4	81.38.97.155.1	
WELDING NECK FLANGE				2	76.64.79.186.1	

* PRESSURE INSTR.CONN.				DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, SPIRAL WOUND				1	85.41.45.104.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.64.103.1	
LAP-JOINT FLANGE				1	76.64.20.108.1	
PIPE NIPPLE 50MM				1	76.32.57.431.1	
STUD BOLT WITH NUTS				4	81.38.97.155.1	
WELDING NECK FLANGE				1	76.64.79.186.1	

* PRESSURE INSTR.CONN.				DN 15	FIG.0M	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, SPIRAL WOUND				1	85.41.45.104.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.64.103.1	
LAP-JOINT FLANGE				1	76.64.20.108.1	
STUD BOLT WITH NUTS				4	81.38.97.155.1	
WELDING NECK FLANGE				1	76.64.79.186.1	

* METERRUN INSTR. CONN				DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, SPIRAL WOUND				4	85.41.45.104.1	
GATE VALVE FLANGED				2	77.23.64.053.1	
LAP-JOINT FLANGE				2	76.64.20.108.1	
STUD BOLT WITH NUTS				8	81.38.97.155.1	
				8	81.38.97.155.1	

* TEMPERATURE INSTR.C.				DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE				1	76.64.60.983.1	
GASKET, SPIRAL WOUND				1	85.41.45.112.1	
STUD BOLT WITH NUTS				4	81.38.97.330.1	
THERMOWELL STRAIGHT L=230 MM				1	76.83.37.101.1	

* TEMPERATURE INSTR.C.				DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE				1	76.64.60.983.1	
GASKET, SPIRAL WOUND				1	85.41.45.112.1	
STUD BOLT WITH NUTS				4	81.38.97.330.1	
THERMOWELL STRAIGHT L=255 MM				1	76.83.37.102.1	

* VENT POINT				DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.108.1	
GASKET, SPIRAL WOUND				1	85.41.45.104.1	
GLOBE VALVE BUTT-WELD ENDS				1	77.34.64.103.1	
PIPE NIPPLE 50MM				1	76.32.57.431.1	
STUD BOLT WITH NUTS				4	81.38.97.155.1	
WELDING NECK FLANGE				1	76.64.79.186.1	

* VENT POINT				DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.112.1	
GASKET, SPIRAL WOUND				1	85.41.45.106.1	
GLOBE VALVE BUTT-WELD ENDS				1	77.34.64.104.1	
PIPE NIPPLE 50MM				1	76.32.57.441.1	
STUD BOLT WITH NUTS				4	81.38.97.269.1	
WELDING NECK FLANGE				1	76.64.79.188.1	

* VENT POINT				DN 20	FIG.1M	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.112.1	
GASKET, SPIRAL WOUND				1	85.41.45.106.1	
GLOBE VALVE BUTT-WELD ENDS				1	77.34.64.104.1	
STUD BOLT WITH NUTS				4	81.38.97.269.1	
WELDING NECK FLANGE				1	76.64.79.188.1	

CLASS 32040

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	450

PRESSURE BAR GA										
DN15 -600	51.7	51.7	51.1	49.2	48.6	46.3	42.8	40.3	36.4	33.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.13
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	40
300	C	C	C	C	E	E	E	E	E	E	E						80	40
250	C	C	C	C	E	E	E	E	E	E	A						100	40
200	C	C	C	C	E	E	E	E	E	A							150	40
150	C	C	C	C	E	E	E	A									200	40
100	C	C	C	C	E	E	D	A									250	40
80	C	C	C	C	D	A											300	40
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (5CR-0.5MO)	PLANT :	
CLASS NO. : 32040	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 32040, REV.C PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P5
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-5CR CLASS 22
		DN 15- 40	ASTM A335-P5

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F5
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F5
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F5
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-5
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-5
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F5

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP5
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F5
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F5
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F5
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP5
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP5
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP5

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A335-P5
MTRR	METER RUN	DN 15- 40	ASTM A182-F5/A335-P5
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F5
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.01	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	095.1	107.1	119.1	131.1	141.1	451.1	461.1	481.1
PIPE NIPPLE 50MM		76.32.57	231.1	241.1	251.1	271.1												
* FLANGES																		
BLIND FLANGE		76.64.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPECTACLE BLIND FLANGE		76.88.08	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	658.1	662.1	666.1	668.1	670.1	672.1	674.1	676.1	678.1	680.1	682.1	684.1	686.1	688.1	690.1	694.1
WELDING NECK FLANGE		76.64.80	256.1	260.1	264.1	268.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	170.1	176.1	180.1	187.1	205.1	225.1	245.1	265.1	285.1	295.1	305.1	315.1	325.1	335.1	345.1	355.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	170.1	176.1	180.1	187.1	205.1	225.1	245.1	265.1	285.1	295.1	305.1	315.1	325.1	335.1	345.1	355.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	657.1	667.1	677.1	687.1	705.1	725.1	745.1	765.1	785.1	805.1	815.1	825.1	835.1	845.1	855.1	865.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	170.1	176.1	180.1	187.1	205.1	225.1	245.1	265.1	285.1	295.1	305.1	315.1	325.1	335.1	345.1	355.1
* VALVES																		
CHECK VALVE FLANGED		77.13.50	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.23.50	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.33.50	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	404.1	406.1	408.1	412.1	414.1	418.1	370.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1	388.1	392.1
METER RUN		76.64.95	222.1	224.1	226.1	228.1												
ORIFICE FLANGE SET		76.64.92					220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
STRAINER Y-TYPE		76.83.20					152.1	154.1	156.1	158.1	161.1	163.1	165.1	167.1	168.1			

RUN* BR	BROB				BROB			
	76.	76.	76.	76.	76.	76.	76.	76.
20* 15		32.66.002.1	32.67.002.1	32.85.520.1	400* 50	79.40.824.1		
25* 15		32.66.012.1	32.67.012.1	32.85.530.1	400* 80	79.40.848.1		
25* 20		32.66.022.1	32.67.022.1	32.85.540.1	400*100	79.40.870.1		
40* 15		32.66.032.1	32.67.032.1		400*150	79.40.890.1	32.66.347.1	32.67.347.1
40* 20		32.66.042.1	32.67.042.1		400*200	79.40.908.1	32.66.351.1	32.67.351.1
40* 25		32.66.052.1	32.67.052.1		400*250	79.40.924.1	32.66.361.1	32.67.361.1
50* 20		32.66.069.1	32.67.069.1		400*300	79.40.938.1	32.66.371.1	32.67.371.1
50* 25		32.66.075.1	32.67.075.1		400*350	79.40.950.1	32.66.381.1	32.67.381.1
50* 40		32.66.085.1	32.67.085.1		450* 50	79.40.826.1		
80* 40		32.66.095.1	32.67.095.1		450* 80	79.40.850.1		
80* 50	79.40.810.1	32.66.101.1	32.67.101.1		450*100	79.40.872.1		
100* 40		32.66.119.1	32.67.119.1		450*150	79.40.892.1		
100* 50	79.40.812.1	32.66.125.1	32.67.125.1		450*200	79.40.910.1	32.66.387.1	32.67.387.1
100* 80	79.40.836.1	32.66.140.1	32.67.140.1		450*250	79.40.926.1	32.66.391.1	32.67.391.1
150* 50	79.40.814.1				450*300	79.40.940.1	32.66.401.1	32.67.401.1
150* 80	79.40.838.1	32.66.155.1	32.67.155.1		450*350	79.40.952.1	32.66.411.1	32.67.411.1
150*100	79.40.860.1	32.66.170.1	32.67.170.1		450*400	79.40.962.1	32.66.421.1	32.67.421.1
200* 50	79.40.816.1				500* 50	79.40.828.1		
200* 80	79.40.840.1				500* 80	79.40.852.1		
200*100	79.40.862.1	32.66.190.1	32.67.190.1		500*100	79.40.874.1		
200*150	79.40.882.1	32.66.215.1	32.67.215.1		500*150	79.40.896.1		
250* 50	79.40.818.1				500*200	79.40.912.1	32.66.429.1	32.67.429.1
250* 80	79.40.842.1				500*250	79.40.928.1	32.66.438.1	32.67.438.1
250*100	79.40.864.1	32.66.240.1	32.67.240.1		500*300	79.40.942.1	32.66.431.1	32.67.431.1
250*150	79.40.884.1	32.66.255.1	32.67.255.1		500*350	79.40.954.1	32.66.441.1	32.67.441.1
250*200	79.40.902.1	32.66.271.1	32.67.271.1		500*400	79.40.964.1	32.66.451.1	32.67.451.1
300* 50	79.40.820.1				500*450	79.40.972.1	32.66.461.1	32.67.461.1
300* 80	79.40.844.1				600* 50	79.40.832.1		
300*100	79.40.866.1				600* 80	79.40.856.1		
300*150	79.40.886.1	32.66.281.1	32.67.281.1		600*100	79.40.878.1		
300*200	79.40.904.1	32.66.291.1	32.67.291.1		600*150	79.40.898.1		
300*250	79.40.920.1	32.66.301.1	32.67.301.1		600*200	79.40.916.1		
350* 50	79.40.822.1				600*250	79.40.932.1	32.66.465.1	32.67.465.1
350* 80	79.40.846.1				600*300	79.40.946.1	32.66.468.1	32.67.468.1
350*100	79.40.868.1				600*350	79.40.958.1	32.66.485.1	32.67.485.1
350*150	79.40.888.1	32.66.311.1	32.67.311.1		600*400	79.40.968.1	32.66.471.1	32.67.471.1
350*200	79.40.906.1	32.66.321.1	32.67.321.1		600*450	79.40.976.1	32.66.481.1	32.67.481.1
350*250	79.40.922.1	32.66.331.1	32.67.331.1		600*500	79.40.982.1	32.66.491.1	32.67.491.1
350*300	79.40.936.1	32.66.341.1	32.67.341.1					

BRANCH	RUN-PIPE	BNIF		BNIP	
		76.80.38		76.80.31	
15	40-150	141.1		251.1	
	200-600	142.1		252.1	
20	40- 80	143.1		253.1	
	100-600	144.1		254.1	
25	40- 40	145.1		255.1	
	50- 50	146.1		256.1	
	80-100	147.1		257.1	
	150-600	148.1		258.1	
40	50- 50	150.1		259.1	
	80- 80	151.1		260.1	
	100-100	152.1		261.1	
	150-300	153.1		263.1	
	350-600	154.1		264.1	

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.60.762.1	230	76.83.37.101.1
813	76.80.60.764.1	255	76.83.37.102.1
1219	76.80.60.766.1	305	76.83.37.103.1
1524	76.80.60.768.1	355	76.83.37.105.1
1829	76.80.60.770.1	405	76.83.37.106.1
2134	76.80.60.772.1	455	76.83.37.107.1
2438	76.80.60.774.1		
2743	76.80.60.776.1		
3048	76.80.60.778.1		

COMP.	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.108.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.50.053.1	
PIPE NIPPLE 50MM	1	76.32.57.231.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.80.256.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GATE VALVE FLANGED	1	77.23.50.054.1	
PIPE NIPPLE 50MM	1	76.32.57.241.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	
WELDING NECK FLANGE	1	76.64.80.260.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GATE VALVE FLANGED	1	77.23.50.054.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.404.1	
GATE VALVE FLANGED	2	77.23.50.053.1	
LAP-JOINT FLANGE	2	76.64.20.458.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
	8	81.38.96.155.1	
WELDING NECK FLANGE	2	76.64.80.256.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.50.053.1	
LAP-JOINT FLANGE	1	76.64.20.458.1	
PIPE NIPPLE 50MM	1	76.32.57.231.1	
STUD BOLT WITH NUTS	4	81.38.96.155.1	
	4	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.80.256.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.50.053.1	
LAP-JOINT FLANGE	1	76.64.20.458.1	
STUD BOLT WITH NUTS	4	81.38.96.155.1	
	4	81.38.96.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.404.1	
GATE VALVE FLANGED	2	77.23.50.053.1	
LAP-JOINT FLANGE	2	76.64.20.458.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
	8	81.38.96.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.583.1	
GASKET, SPIRAL WOUND	1	85.41.46.412.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.583.1	
GASKET, SPIRAL WOUND	1	85.41.46.412.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.108.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GLOBE VALVE FLANGED	1	77.33.50.053.1	
PIPE NIPPLE 50MM	1	76.32.57.231.1	
STUD BOLT WITH NUTS	8	81.38.96.155.1	
WELDING NECK FLANGE	1	76.64.80.256.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GLOBE VALVE FLANGED	1	77.33.50.054.1	
PIPE NIPPLE 50MM	1	76.32.57.241.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	
WELDING NECK FLANGE	1	76.64.80.260.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.112.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GLOBE VALVE FLANGED	1	77.33.50.054.1	
STUD BOLT WITH NUTS	8	81.38.96.269.1	

CLASS 32080

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	450

PRESSURE BAR GA										
DN15 -600	47.9	47.6	46.6	45.1	44.2	42.9	42.0	40.3	36.4	33.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.5
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 40
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 40
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 40
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 40
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 40
100	C	C	C	C	D	D	A										250 40
80	C	C	C	C	D	A											300 40
50	C	C	C	B	A												350 40
40	C	B	B	A													400 40
25	B	B	A														450 40
20	B	A															500 40
15	A																600 40

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (0.5MO)	PLANT :	
CLASS NO. : 32080	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 32080, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P1
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A672-L70 CLASS 22
		DN 15- 40	ASTM A335-P1

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F1
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F1
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F1
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A204-A/B
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A204-A/B
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F1

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP1
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP1
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP1
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP1

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F1
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F1
BR0B	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F1
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP1
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP1
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP1

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A204-A/B
MTRR	METER RUN	DN 15- 40	ASTM A182-F1/A335-P1
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F1
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

32080, REV.B PAGE 3

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.06	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	095.1	107.1	119.1	131.1	141.1	751.1	761.1	781.1
PIPE NIPPLE 50MM		76.32.57	031.1	041.1	051.1	071.1												
* FLANGES																		
BLIND FLANGE		76.64.09	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPECTACLE BLIND FLANGE		76.88.05	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
WELDING NECK FLANGE		76.64.78	186.1	188.1	190.1	192.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	710.1	715.1	719.1	727.1	735.1	745.1	755.1	765.1	775.1	785.1	795.1	805.1	815.1	825.1	835.1	855.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.37	210.1	215.1	219.1	227.1	235.1	245.1	255.1	265.1	275.1	285.1	295.1	305.1	315.1	325.1	335.1	355.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.41	677.1	687.1	697.1	707.1	715.1	725.1	735.1	745.1	755.1	765.1	775.1	785.1	795.1	805.1	815.1	835.1
EQUAL TEE BUTT-WELD ENDS		76.32.83	210.1	215.1	219.1	227.1	235.1	245.1	255.1	265.1	275.1	285.1	295.1	305.1	315.1	325.1	335.1	355.1
* VALVES																		
CHECK VALVE FLANGED		77.13.60	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.23.60	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.33.60	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.64.95	022.1	024.1	026.1	028.1												
ORIFICE FLANGE SET		76.64.90					154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
STRAINER Y-TYPE		76.83.20					052.1	054.1	056.1	058.1	061.1	063.1	065.1	067.1	068.1			

RUN* BR	BROB				BROB			
	76.	76.	76.	76.	76.	76.	76.	76.
20* 15		32.64.002.1	32.65.002.1	32.85.620.1	400* 50	79.20.824.1		
25* 15		32.64.012.1	32.65.012.1	32.85.630.1	400* 80	79.20.848.1		
25* 20		32.64.022.1	32.65.022.1	32.85.640.1	400*100	79.20.870.1		
40* 15		32.64.032.1	32.65.032.1		400*150	79.20.890.1	32.64.347.1	32.65.347.1
40* 20		32.64.042.1	32.65.042.1		400*200	79.20.908.1	32.64.351.1	32.65.351.1
40* 25		32.64.052.1	32.65.052.1		400*250	79.20.924.1	32.64.361.1	32.65.361.1
50* 20		32.64.069.1	32.65.069.1		400*300	79.20.938.1	32.64.371.1	32.65.371.1
50* 25		32.64.075.1	32.65.075.1		400*350	79.20.950.1	32.64.381.1	32.65.381.1
50* 40		32.64.085.1	32.65.085.1		450* 50	79.20.826.1		
80* 40		32.64.095.1	32.65.095.1		450* 80	79.20.850.1		
80* 50	79.20.810.1	32.64.101.1	32.65.101.1		450*100	79.20.872.1		
100* 40		32.64.119.1	32.65.119.1		450*150	79.20.892.1		
100* 50	79.20.812.1	32.64.125.1	32.65.125.1		450*200	79.20.910.1	32.64.387.1	32.65.387.1
100* 80	79.20.836.1	32.64.140.1	32.65.140.1		450*250	79.20.926.1	32.64.391.1	32.65.391.1
150* 50	79.20.814.1				450*300	79.20.940.1	32.64.401.1	32.65.401.1
150* 80	79.20.838.1	32.64.155.1	32.65.155.1		450*350	79.20.952.1	32.64.411.1	32.65.411.1
150*100	79.20.860.1	32.64.170.1	32.65.170.1		450*400	79.20.962.1	32.64.421.1	32.65.421.1
200* 50	79.20.816.1				500* 50	79.20.828.1		
200* 80	79.20.840.1				500* 80	79.20.852.1		
200*100	79.20.862.1	32.64.190.1	32.65.190.1		500*100	79.20.874.1		
200*150	79.20.882.1	32.64.215.1	32.65.215.1		500*150	79.20.896.1		
250* 50	79.20.818.1				500*200	79.20.912.1	32.64.429.1	32.65.429.1
250* 80	79.20.842.1				500*250	79.20.928.1	32.64.438.1	32.65.438.1
250*100	79.20.864.1	32.64.240.1	32.65.240.1		500*300	79.20.942.1	32.64.431.1	32.65.431.1
250*150	79.20.884.1	32.64.255.1	32.65.255.1		500*350	79.20.954.1	32.64.441.1	32.65.441.1
250*200	79.20.902.1	32.64.271.1	32.65.271.1		500*400	79.20.964.1	32.64.451.1	32.65.451.1
300* 50	79.20.820.1				500*450	79.20.972.1	32.64.461.1	32.65.461.1
300* 80	79.20.844.1				600* 50	79.20.832.1		
300*100	79.20.866.1				600* 80	79.20.856.1		
300*150	79.20.886.1	32.64.281.1	32.65.281.1		600*100	79.20.878.1		
300*200	79.20.904.1	32.64.291.1	32.65.291.1		600*150	79.20.898.1		
300*250	79.20.920.1	32.64.301.1	32.65.301.1		600*200	79.20.916.1		
350* 50	79.20.822.1				600*250	79.20.932.1	32.64.465.1	32.65.465.1
350* 80	79.20.846.1				600*300	79.20.946.1	32.64.468.1	32.65.468.1
350*100	79.20.868.1				600*350	79.20.958.1	32.64.485.1	32.65.485.1
350*150	79.20.888.1	32.64.311.1	32.65.311.1		600*400	79.20.968.1	32.64.471.1	32.65.471.1
350*200	79.20.906.1	32.64.321.1	32.65.321.1		600*450	79.20.976.1	32.64.481.1	32.65.481.1
350*250	79.20.922.1	32.64.331.1	32.65.331.1		600*500	79.20.982.1	32.64.491.1	32.65.491.1
350*300	79.20.936.1	32.64.341.1	32.65.341.1					

BRANCH	RUN-PIPE	BNIF		BNIP	
		76.80.38		76.80.31	
15	40-150	041.1		151.1	
	200-600	042.1		152.1	
20	40- 80	043.1		153.1	
	100-600	044.1		154.1	
25	40- 40	045.1		155.1	
	50- 50	046.1		156.1	
	80-100	047.1		157.1	
	150-600	048.1		158.1	
40	50- 50	050.1		159.1	
	80- 80	051.1		160.1	
	100-100	052.1		161.1	
	150-300	053.1		163.1	
	350-600	054.1		164.1	

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.722.1	230	76.83.37.101.1
813	76.80.60.724.1	255	76.83.37.102.1
1219	76.80.60.726.1	305	76.83.37.103.1
1524	76.80.60.728.1	355	76.83.37.105.1
1829	76.80.60.730.1	405	76.83.37.106.1
2134	76.80.60.732.1	455	76.83.37.107.1
2438	76.80.60.734.1		
2743	76.80.60.736.1		
3048	76.80.60.738.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 70	15	4	1/2	* 70
20	4	5/8	* 80	20	4	5/8	* 80
25	4	5/8	* 80	25	4	5/8	* 90
40	4	3/4	* 90	40	4	3/4	* 100
50	8	5/8	* 90				
80	8	3/4	* 110				
100	8	3/4	* 120				
150	12	3/4	* 130				
200	12	7/8	* 140				
250	16	1	* 160				
300	16	1 1/8	* 170				
350	20	1 1/8	* 180				
400	20	1 1/4	* 190				
450	24	1 1/4	* 200				
500	24	1 1/4	* 210				
600	24	1 1/2	* 240				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 80
				20	4	5/8	* 90
				25	4	5/8	* 90
				40	4	3/4	* 100
50	8	5/8	* 150	50	8	5/8	* 100
80	8	3/4	* 150	80	8	3/4	* 120
100	12	3/4	* 140	100	8	3/4	* 130
150	12	3/4	* 140	150	12	3/4	* 150
200	12	7/8	* 150	200	12	7/8	* 170
250	16	1	* 170	250	16	1	* 190
300	16	1 1/8	* 190	300	16	1 1/8	* 210
350	20	1 1/8	* 200	350	20	1 1/8	* 220
400	20	1 1/4	* 210	400	20	1 1/4	* 240
450	24	1 1/4	* 220	450	24	1 1/4	* 250
500	24	1 1/4	* 230	500	24	1 1/4	* 260
600	24	1 1/2	* 260	600	24	1 1/2	* 300

ASSEMBLIES

* DRAIN POINT				DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.09.108.1	
GASKET, RF TANGED INSERT				2	85.30.01.104.1	
GATE VALVE FLANGED				1	77.23.60.053.1	
PIPE NIPPLE 50MM				1	76.32.57.031.1	
STUD BOLT WITH NUTS				8	81.38.96.155.1	
WELDING NECK FLANGE				1	76.64.78.186.1	

* DRAIN POINT				DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.09.112.1	
GASKET, RF TANGED INSERT				2	85.30.01.106.1	
GATE VALVE FLANGED				1	77.23.60.054.1	
PIPE NIPPLE 50MM				1	76.32.57.041.1	
STUD BOLT WITH NUTS				8	81.38.96.269.1	
WELDING NECK FLANGE				1	76.64.78.188.1	

* DRAIN POINT				DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.09.112.1	
GASKET, RF TANGED INSERT				2	85.30.01.106.1	
GATE VALVE FLANGED				1	77.23.60.054.1	
STUD BOLT WITH NUTS				8	81.38.96.269.1	

* ORIFICE INSTR.CONN.				DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, RF TANGED INSERT				4	85.30.01.104.1	
GATE VALVE FLANGED				2	77.23.60.053.1	
LAP-JOINT FLANGE				2	76.64.20.758.1	
STUD BOLT WITH NUTS				8	81.38.96.155.1	
				8	81.38.96.155.1	
WELDING NECK FLANGE				2	76.64.78.186.1	

* PRESSURE INSTR.CONN.				DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, RF TANGED INSERT				2	85.30.01.104.1	
GATE VALVE FLANGED				1	77.23.60.053.1	
LAP-JOINT FLANGE				1	76.64.20.758.1	
PIPE NIPPLE 50MM				1	76.32.57.031.1	
STUD BOLT WITH NUTS				4	81.38.96.155.1	
				4	81.38.96.155.1	
WELDING NECK FLANGE				1	76.64.78.186.1	

* PRESSURE INSTR.CONN.				DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, RF TANGED INSERT				2	85.30.01.104.1	
GATE VALVE FLANGED				1	77.23.60.053.1	
LAP-JOINT FLANGE				1	76.64.20.758.1	
STUD BOLT WITH NUTS				4	81.38.96.155.1	
				4	81.38.96.155.1	

* METERRUN INSTR. CONN				DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, RF TANGED INSERT				4	85.30.01.104.1	
GATE VALVE FLANGED				2	77.23.60.053.1	
LAP-JOINT FLANGE				2	76.64.20.758.1	
STUD BOLT WITH NUTS				8	81.38.96.155.1	
				8	81.38.96.155.1	

* TEMPERATURE INSTR.C.				DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE				1	76.64.60.933.1	
GASKET, RF TANGED INSERT				1	85.30.01.112.1	
STUD BOLT WITH NUTS				4	81.38.96.330.1	
THERMOWELL STRAIGHT L=230 MM				1	76.83.37.101.1	

* TEMPERATURE INSTR.C.				DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE				1	76.64.60.933.1	
GASKET, RF TANGED INSERT				1	85.30.01.112.1	
STUD BOLT WITH NUTS				4	81.38.96.330.1	
THERMOWELL STRAIGHT L=255 MM				1	76.83.37.102.1	

* VENT POINT				DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.09.108.1	
GASKET, RF TANGED INSERT				2	85.30.01.104.1	
GLOBE VALVE FLANGED				1	77.33.60.053.1	
PIPE NIPPLE 50MM				1	76.32.57.031.1	
STUD BOLT WITH NUTS				8	81.38.96.155.1	
WELDING NECK FLANGE				1	76.64.78.186.1	

* VENT POINT				DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.09.112.1	
GASKET, RF TANGED INSERT				2	85.30.01.106.1	
GLOBE VALVE FLANGED				1	77.33.60.054.1	
PIPE NIPPLE 50MM				1	76.32.57.041.1	
STUD BOLT WITH NUTS				8	81.38.96.269.1	
WELDING NECK FLANGE				1	76.64.78.188.1	

* VENT POINT				DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.09.112.1	
GASKET, RF TANGED INSERT				2	85.30.01.106.1	
GLOBE VALVE FLANGED				1	77.33.60.054.1	
STUD BOLT WITH NUTS				8	81.38.96.269.1	

CLASS 32110

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400

PRESSURE BAR GA									
DN15 -600	51.7	51.7	51.4	49.6	48.0	46.2	42.8	40.3	36.4

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 40
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 40
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 40
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 40
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 40
100	C	C	C	C	D	D	A										250 40
80	C	C	C	C	D	A											300 40
50	C	C	C	B	A												350 40
40	C	B	B	A													400 40
25	B	B	A														450 40
20	B	A															500 40
15	A																600 40

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 32110	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 32110, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-1.25CR CLASS 22
		DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

32110, REV.B PAGE 3

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.11	021.1	029.1	037.1	053.1	059.1	067.1	075.1	084.1	095.1	107.1	119.1	131.1	141.1	451.1	461.1	481.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.64.10	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	144.1
SPECTACLE BLIND FLANGE		76.88.07	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1	284.1	286.1	288.1	290.1	294.1
WELDING NECK FLANGE		76.64.79	186.1	188.1	190.1	192.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	415.1	425.1	435.1	445.1	455.1	465.1	475.1	485.1	495.1	505.1	515.1	535.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	035.1	045.1	055.1	065.1	075.1	085.1	095.1	105.1	115.1	125.1	135.1	155.1
* VALVES																		
CHECK VALVE FLANGED		77.13.66	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GATE VALVE FLANGED		77.23.65	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
GLOBE VALVE FLANGED		77.33.65	253.1	254.1	255.1	257.1	258.1	260.1	262.1	264.1	265.1							
* MISCELLANEOUS																		
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.64.95	122.1	124.1	126.1	128.1												
ORIFICE FLANGE SET		76.64.91					274.1	276.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
STRAINER Y-TYPE		76.83.20					252.1	254.1	256.1	258.1	261.1	263.1	265.1	267.1	268.1			

										BNIF	BNIP	
				BROB	RECB	REEB	TERB	BROB	RECB	REEB		
				76.	76.	76.	76.	76.	76.	76.	76.80.38	76.80.31
RUN* BR								BRANCH	RUN-PIPE			
20* 15		32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.24.824.1		15	40-150	341.1	181.1	
25* 15		32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.24.848.1			200-600	342.1	182.1	
25* 20		32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.24.870.1		20	40- 80	343.1	183.1	
40* 15		32.68.032.1	32.69.032.1		400*150	79.24.890.1	32.68.347.1		100-600	344.1	184.1	
40* 20		32.68.042.1	32.69.042.1		400*200	79.24.908.1	32.68.351.1	25	40- 40	345.1	185.1	
40* 25		32.68.052.1	32.69.052.1		400*250	79.24.924.1	32.68.361.1		50- 50	346.1	186.1	
50* 20		32.68.069.1	32.69.069.1		400*300	79.24.938.1	32.68.371.1		80-100	347.1	187.1	
50* 25		32.68.075.1	32.69.075.1		400*350	79.24.950.1	32.68.381.1		150-600	348.1	188.1	
50* 40		32.68.085.1	32.69.085.1		450* 50	79.24.826.1		40	50- 50	350.1	189.1	
80* 40		32.68.095.1	32.69.095.1		450* 80	79.24.850.1			80- 80	351.1	190.1	
80* 50	79.24.810.1	32.68.101.1	32.69.101.1		450*100	79.24.872.1			100-100	352.1	191.1	
100* 40		32.68.119.1	32.69.119.1		450*150	79.24.892.1			150-300	353.1	193.1	
100* 50	79.24.812.1	32.68.125.1	32.69.125.1		450*200	79.24.910.1	32.68.351.1		350-600	354.1	194.1	
100* 80	79.24.836.1	32.68.140.1	32.69.140.1		450*250	79.24.926.1	32.68.391.1					
150* 50	79.24.814.1				450*300	79.24.940.1	32.68.401.1					
150* 80	79.24.838.1	32.68.155.1	32.69.155.1		450*350	79.24.952.1	32.68.411.1					
150*100	79.24.860.1	32.68.170.1	32.69.170.1		450*400	79.24.962.1	32.68.421.1					
200* 50	79.24.816.1				500* 50	79.24.828.1						
200* 80	79.24.840.1				500* 80	79.24.852.1						
200*100	79.24.862.1	32.68.190.1	32.69.190.1		500*100	79.24.874.1						
200*150	79.24.882.1	32.68.215.1	32.69.215.1		500*150	79.24.896.1						
250* 50	79.24.818.1				500*200	79.24.912.1	32.68.429.1					
250* 80	79.24.842.1				500*250	79.24.928.1	32.68.438.1					
250*100	79.24.864.1	32.68.240.1	32.69.240.1		500*300	79.24.942.1	32.68.431.1					
250*150	79.24.884.1	32.68.255.1	32.69.255.1		500*350	79.24.954.1	32.68.441.1					
250*200	79.24.902.1	32.68.271.1	32.69.271.1		500*400	79.24.964.1	32.68.451.1					
300* 50	79.24.820.1				500*450	79.24.972.1	32.68.461.1					
300* 80	79.24.844.1				600* 50	79.24.832.1						
300*100	79.24.866.1				600* 80	79.24.856.1						
300*150	79.24.886.1	32.68.281.1	32.69.281.1		600*100	79.24.878.1						
300*200	79.24.904.1	32.68.291.1	32.69.291.1		600*150	79.24.898.1						
300*250	79.24.920.1	32.68.301.1	32.69.301.1		600*200	79.24.916.1						
350* 50	79.24.822.1				600*250	79.24.932.1	32.68.465.1					
350* 80	79.24.846.1				600*300	79.24.946.1	32.68.468.1					
350*100	79.24.868.1				600*350	79.24.958.1	32.68.485.1					
350*150	79.24.888.1	32.68.311.1	32.69.311.1		600*400	79.24.968.1	32.68.471.1					
350*200	79.24.906.1	32.68.321.1	32.69.321.1		600*450	79.24.976.1	32.68.481.1					
350*250	79.24.922.1	32.68.331.1	32.69.331.1		600*500	79.24.982.1	32.68.491.1					
350*300	79.24.936.1	32.68.341.1	32.69.341.1									

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					
350	20	1 1/8	*	180					
400	20	1 1/4	*	190					
450	24	1 1/4	*	200					
500	24	1 1/4	*	210					
600	24	1 1/2	*	240					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210
350	20	1 1/8	*	200	350	20	1 1/8	*	220
400	20	1 1/4	*	210	400	20	1 1/4	*	240
450	24	1 1/4	*	220	450	24	1 1/4	*	250
500	24	1 1/4	*	230	500	24	1 1/4	*	260
600	24	1 1/2	*	260	600	24	1 1/2	*	300

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.23.65.053.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GATE VALVE FLANGED	1	77.23.65.054.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	
WELDING NECK FLANGE	1	76.64.79.188.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GATE VALVE FLANGED	1	77.23.65.054.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.23.65.053.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	8	81.38.61.155.1	
	2	76.64.79.186.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.23.65.053.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GATE VALVE FLANGED	1	77.23.65.053.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
GATE VALVE FLANGED	2	77.23.65.053.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
	8	81.38.61.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.983.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.983.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.108.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.33.65.253.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	
WELDING NECK FLANGE	1	76.64.79.186.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.33.65.254.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	
WELDING NECK FLANGE	1	76.64.79.188.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.112.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.33.65.254.1	
STUD BOLT WITH NUTS	8	81.38.61.269.1	

CLASS 33011

DESIGN LIMITS									
	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -150	49.4	48.5	44.0	40.9	38.1	35.9	34.0	32.8	31.6
DN200-200	41.9	41.9	41.9	40.9	38.1	35.9	34.0	32.8	31.6
DN250-300	37.4	37.4	37.4	37.4	37.4	35.9	34.0	32.8	31.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES												
RUN SIZE	BRANCH SIZE											
	15	20	25	40	50	80	100	150	200	250	300	

300	C	C	C	C	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	A			
150	C	C	C	C	E	E	E	A				
100	C	C	C	C	E	E	A					
80	C	C	C	C	E	A						
50	C	C	C	B	A							
40	C	B	B	A								
25	B	B	A									
20	B	A										
15	A											

TABLE OF SCHEDULES

DN	SCHEDULE

15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	10S
200	10S
250	10S
300	20

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 321/347	PLANT :	
CLASS NO. : 33011	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321/347
PNPP	PIPE NIPPLE 50MM	DN 15- 20	ASTM A312-TP321/347

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F321/347
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP321/347
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP321/347
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F321/347

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP321/347
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321/347
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321/347
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F321/347
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP321/347
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP321/347
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP321/347

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-300	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321/347
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: AISI 321/347 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 321/347 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 321/347
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F321/347
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-300	SIEVE: AISI 316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE										
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE												
PIPE	74.36.15	018.1	026.1	033.1	049.1	057.1	065.1	073.1	082.1	091.1	103.1	116.1
PIPE NIPPLE 50MM	76.33.57	231.1	241.1	249.1	268.1							
* FLANGES												
BLIND FLANGE	76.65.10	112.1	114.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1
SPECTACLE BLIND FLANGE	76.88.09	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	758.1	762.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	782.1
WELDING NECK FLANGE	76.65.79			766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	
	76.65.80	182.1	184.1									168.1
* FITTINGS												
CAP BUTT-WELD.END	76.33.18	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	154.1	167.1	186.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.38	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	154.1	167.1	186.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.39	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	686.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	154.1	167.1	186.1
* VALVES												
CHECK VALVE FLANGED	77.13.20	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED	77.23.20	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GLOBE VALVE FLANGED	77.33.20	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
* MISCELLANEOUS												
GASKET, RF TANGED INSERT	85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1
METER RUN	76.65.96	812.1	814.1	816.1	818.1							
ORIFICE FLANGE SET	76.65.95					270.1	272.1	074.1	076.1	078.1	080.1	168.1
STRAINER Y-TYPE	76.83.21					252.1	254.1	256.1	258.1	259.1	261.1	263.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.69.066.1	33.71.066.1	33.85.018.1
25* 15		33.69.079.1	33.71.079.1	33.85.032.1
25* 20		33.69.089.1	33.71.089.1	33.85.037.1
40* 15		33.69.099.1	33.71.099.1	
40* 20		33.69.119.1	33.71.119.1	33.85.032.1
40* 25		33.69.124.1	33.71.124.1	33.85.056.1
50* 20		33.69.132.1	33.71.132.1	
50* 25		33.69.134.1	33.71.134.1	
50* 40		33.69.144.1	33.71.144.1	33.85.083.1
80* 40		33.69.174.1	33.71.174.1	
80* 50	79.72.360.1	33.69.184.1	33.71.184.1	
100* 40		33.69.190.1	33.71.190.1	
100* 50	79.72.362.1	33.69.204.1	33.71.204.1	
100* 80	79.72.386.1	33.69.214.1	33.71.214.1	
150* 50	79.72.364.1			
150* 80	79.72.388.1	33.69.244.1	33.71.244.1	
150*100	79.72.410.1	33.69.254.1	33.71.254.1	
200* 50	79.72.366.1			
200* 80	79.72.390.1			
200*100	79.72.412.1	33.69.264.1	33.71.264.1	
200*150	79.72.432.1	33.69.274.1	33.71.274.1	
250* 50	79.72.368.1			
250* 80	79.72.392.1			
250*100	79.72.414.1	33.69.284.1	33.71.284.1	
250*150	79.72.434.1	33.69.289.1	33.71.289.1	
250*200	79.72.452.1	33.69.303.1	33.71.303.1	
300* 50	79.72.824.1			
300* 80	79.72.844.1			
300*100	79.72.864.1			
300*150	79.72.884.1	33.69.319.1	33.71.319.1	
300*200	79.72.902.1	33.69.332.1	33.71.332.1	
300*250	79.72.924.1	33.69.345.1	33.71.345.1	

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-150	541.1	476.1
	200-300	542.1	477.1
20	40- 80	543.1	478.1
	100-300	544.1	479.1
25	40- 40	565.1	490.1
	50- 50	566.1	491.1
	80-100	567.1	492.1
	150-300	568.1	493.1
40	50- 50	570.1	494.1
	80- 80	571.1	495.1
	100-100	572.1	496.1
	150-300	573.1	497.1
LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.70.162.1	450	76.81.70.662.1
840	76.81.70.164.1	840	76.81.70.664.1
1230	76.81.70.166.1	1230	76.81.70.666.1
LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.862.1	230	76.83.37.101.1
813	76.80.61.864.1	255	76.83.37.102.1
1219	76.80.61.866.1	305	76.83.37.103.1
1524	76.80.61.868.1	355	76.83.37.105.1
1829	76.80.61.870.1	405	76.83.37.106.1
2134	76.80.61.872.1	455	76.83.37.107.1
2438	76.80.61.874.1		
2743	76.80.61.876.1		
3048	76.80.61.878.1		

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.112.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.20.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.182.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.114.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.23.20.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.65.80.184.1

* DRAIN POINT DN 20 FIG.0H DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.114.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.23.20.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.23.20.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.65.80.182.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.20.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.182.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.20.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.23.20.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.112.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.33.20.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.182.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.114.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.33.20.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.65.80.184.1

* VENT POINT DN 20 FIG.1H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.114.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.33.20.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 33021

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
		0	50	100	150	200	250	300	350	400
		PRESSURE BAR GA								
DN15	-300	49.6	48.1	42.2	38.5	35.7	33.5	31.6	30.4	29.2

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE										
	15	20	25	40	50	80	100	150	200	250	300
300	C	C	C	C	E	E	E	E	E	E	A
250	C	C	C	C	E	E	E	E	E	A	
200	C	C	C	C	E	E	E	E	A		
150	C	C	C	C	E	E	E	A			
100	C	C	C	C	E	E	A				
80	C	C	C	C	E	A					
50	C	C	C	B	A						
40	C	B	B	A							
25	B	B	A								
20	B	A									
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE
15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	40S
200	40S
250	40S
300	40S

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 316	PLANT :	
CLASS NO. : 33021	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-300	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP316
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-300	SIEVE: AISI 316
TWGS	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 33021, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE										
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE												
PIPE	74.36.33	018.1	026.1	033.1	049.1	057.1	065.1	073.1	083.1	094.1	106.1	118.1
PIPE NIPPLE 50MM	76.33.57	931.1	941.1	949.1	968.1							
* FLANGES												
BLIND FLANGE	76.65.10	412.1	414.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1
SPECTACLE BLIND FLANGE	76.88.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	482.1
WELDING NECK FLANGE	76.65.79			406.1	408.1	410.1	412.1	414.1				
	76.65.80	402.1	404.1						416.1	418.1	420.1	422.1
* FITTINGS												
CAP BUTT-WELD.END	76.33.19	286.1	296.1	304.1	324.1	334.1	354.1	374.1	396.1	409.1	421.1	438.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	286.1	296.1	304.1	324.1	334.1	354.1	374.1	396.1	409.1	421.1	438.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	286.1	296.1	304.1	324.1	334.1	354.1	374.1	396.1	409.1	421.1	438.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	786.1	796.1	804.1	824.1	834.1	854.1	874.1	896.1	909.1	921.1	938.1
* VALVES												
CHECK VALVE FLANGED	77.13.03	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED	77.23.03	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GLOBE VALVE FLANGED	77.33.03	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
* MISCELLANEOUS												
GASKET, RF TANGED INSERT	85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1
METER RUN	76.65.96	412.1	414.1	416.1	418.1							
ORIFICE FLANGE SET	76.65.92					470.1	472.1	264.1	416.1	418.1	420.1	422.1
STRAINER Y-TYPE	76.83.21					452.1	454.1	456.1	457.1	461.1	467.1	470.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.566.1	33.72.566.1	33.85.618.1
25* 15		33.70.579.1	33.72.579.1	33.85.632.1
25* 20		33.70.589.1	33.72.589.1	33.85.637.1
40* 15		33.70.599.1	33.72.599.1	33.85.643.1
40* 20		33.70.619.1	33.72.619.1	33.85.649.1
40* 25		33.70.624.1	33.72.624.1	33.85.656.1
50* 20		36.50.090.1	36.63.090.1	33.85.665.1
50* 25		33.70.634.1	33.72.634.1	33.85.673.1
50* 40		33.70.644.1	33.72.644.1	33.85.683.1
80* 40		33.70.674.1	33.72.674.1	33.85.693.1
80* 50	79.68.360.1	33.70.684.1	33.72.684.1	33.89.352.1
100* 40		33.70.693.1	33.72.693.1	33.89.360.1
100* 50	79.68.362.1	33.70.704.1	33.72.704.1	33.89.368.1
100* 80	79.68.386.1	33.70.714.1	33.72.714.1	33.89.376.1
150* 50	79.68.544.1			
150* 80	79.68.558.1	33.70.749.1	33.72.749.1	33.89.385.1
150*100	79.68.570.1	33.70.759.1	33.72.759.1	33.89.393.1
200* 50	79.68.546.1			
200* 80	79.68.560.1			
200*100	79.68.572.1	33.70.766.1	33.72.766.1	33.89.401.1
200*150	79.69.706.1	33.70.779.1	33.72.779.1	33.89.410.1
250* 50	79.68.548.1			
250* 80	79.68.562.1			
250*100	79.68.574.1	36.50.258.1	36.63.258.1	33.89.417.1
250*150	79.69.708.1	33.70.793.1	33.72.793.1	33.89.423.1
250*200	79.69.726.1	33.70.809.1	33.72.809.1	33.89.428.1
300* 50	79.68.550.1			
300* 80	79.68.564.1			
300*100	79.68.576.1			
300*150	79.69.710.1	33.70.817.1	33.72.817.1	33.89.433.1
300*200	79.69.728.1	33.70.830.1	33.72.830.1	33.89.438.1
300*250	79.69.744.1	33.70.842.1	33.72.842.1	33.89.443.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE		
15	40-150	041.1	451.1
	200-300	042.1	452.1
20	40- 80	043.1	453.1
	100-300	044.1	454.1
25	40- 40	065.1	465.1
	50- 50	066.1	466.1
	80-100	067.1	467.1
	150-300	068.1	468.1
40	50- 50	070.1	469.1
	80- 80	071.1	470.1
	100-100	072.1	471.1
	150-300	073.1	472.1
LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.70.062.1	450	76.81.70.562.1
840	76.81.70.064.1	840	76.81.70.564.1
1230	76.81.70.066.1	1230	76.81.70.566.1
LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.462.1	230	76.83.37.101.1
813	76.80.61.464.1	255	76.83.37.102.1
1219	76.80.61.466.1	305	76.83.37.103.1
1524	76.80.61.468.1	355	76.83.37.105.1
1829	76.80.61.470.1	405	76.83.37.106.1
2134	76.80.61.472.1	455	76.83.37.107.1
2438	76.80.61.474.1		
2743	76.80.61.476.1		
3048	76.80.61.478.1		

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.412.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.03.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.402.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.414.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.23.03.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.65.80.404.1

* DRAIN POINT DN 20 FIG.0H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.414.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.23.03.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.23.03.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.65.80.402.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.03.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.402.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.03.053.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.23.03.053.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.412.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.33.03.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.402.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.414.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.33.03.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.65.80.404.1

* VENT POINT DN 20 FIG.1H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.414.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.33.03.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 33031

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	49.6	48.1	45.0	42.2	38.0	29.0	20.0	11.0
DN100-150	41.2	41.2	41.2	39.0	32.0	24.0	17.0	9.0
DN200-300	28.7	28.7	28.7	28.7	23.0	18.0	12.0	7.0

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY BS5351 BALL VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- USE SPIRAL WOUND GASKETS (CLASS 31300), IF GRAPHITE TANGED INSERT GASKETS ARE NOT ALLOWED DUE TO PRODUCT CONTAMINATION

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150
300	C	C	C	C	E	E	E	E
250	C	C	C	C	E	E	E	E
200	C	C	C	C	E	E	E	E
150	C	C	C	C	E	E	E	E
100	C	C	C	C	E	E	E	E
80	C	C	C	C	E	E	E	E
50	C	C	C	B	A			
40	C	B	B	A				
25	B	B	A					
20	B	A						
15	A							

TABLE OF SCHEDULES

DN	SCHEDULE
15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	10S
200	10S
250	10S
300	10S

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 316	PLANT :	
CLASS NO. : 33031	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 33031, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L) ,PTFE
CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-300	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP316
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-100	SIEVE: AISI 316
		DN150-300	ASTM A182-F316
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 33031, REV.B PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.36.33	018.1	026.1	033.1	049.1	057.1	065.1	073.1	082.1	091.1	103.1	115.1
PIPE NIPPLE	50MM	76.33.57	931.1	941.1	949.1	968.1							
* FLANGES													
BLIND FLANGE		76.65.10	412.1	414.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1
SPECTACLE BLIND FLANGE		76.88.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	482.1
WELDING NECK FLANGE		76.65.79			406.1	408.1	410.1	412.1	414.1	416.1	418.1	420.1	422.1
		76.65.80	402.1	404.1									
* FITTINGS													
CAP BUTT-WELD.END		76.33.19	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	786.1	796.1	804.1	824.1	834.1	854.1	874.1	893.1	904.1	917.1	933.1
* VALVES													
BALL VALVE RED. BORE FLANGED		77.03.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1	
CHECK VALVE FLANGED		77.13.03	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED		77.23.03								064.1	065.1	066.1	067.1
GLOBE VALVE FLANGED		77.33.03	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
* MISCELLANEOUS													
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1
METER RUN		76.65.96	412.1	414.1	416.1	418.1							
ORIFICE FLANGE SET		76.65.92					470.1	472.1	264.1	266.1	268.1	270.1	272.1
STRAINER Y-TYPE		76.83.21					452.1	454.1	456.1	455.1	459.1	465.1	469.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.566.1	33.72.566.1	33.85.618.1
25* 15		33.70.579.1	33.72.579.1	33.85.632.1
25* 20		33.70.589.1	33.72.589.1	33.85.637.1
40* 15		33.70.599.1	33.72.599.1	33.85.643.1
40* 20		33.70.619.1	33.72.619.1	33.85.649.1
40* 25		33.70.624.1	33.72.624.1	33.85.656.1
50* 20		36.50.090.1	36.63.090.1	33.85.665.1
50* 25		33.70.634.1	33.72.634.1	33.85.673.1
50* 40		33.70.644.1	33.72.644.1	33.85.683.1
80* 40		33.70.674.1	33.72.674.1	33.85.693.1
80* 50	79.68.360.1	33.70.684.1	33.72.684.1	33.89.352.1
100* 40		33.70.693.1	33.72.693.1	33.89.360.1
100* 50	79.68.362.1	33.70.704.1	33.72.704.1	33.89.368.1
100* 80	79.68.386.1	33.70.714.1	33.72.714.1	33.89.376.1
150* 50	79.68.364.1			
150* 80	79.68.388.1	33.70.744.1	33.72.744.1	33.89.384.1
150*100	79.68.410.1	33.70.754.1	33.72.754.1	33.89.392.1
200* 50	79.68.366.1			
200* 80	79.68.390.1			
200*100	79.68.412.1	33.70.764.1	33.72.764.1	33.89.400.1
200*150	79.68.432.1	33.70.774.1	33.72.774.1	33.89.408.1
250* 50	79.68.368.1			
250* 80	79.68.392.1			
250*100	79.68.414.1	36.50.250.1	36.63.250.1	33.89.416.1
250*150	79.68.434.1	33.70.789.1	33.72.789.1	33.89.421.1
250*200	79.68.452.1	33.70.803.1	33.72.803.1	33.89.426.1
300* 50	79.68.370.1			
300* 80	79.68.394.1			
300*100	79.68.416.1			
300*150	79.68.436.1	33.70.816.1	33.72.816.1	33.89.431.1
300*200	79.68.454.1	33.70.827.1	33.72.827.1	33.89.436.1
300*250	79.68.470.1	33.70.839.1	33.72.839.1	33.89.441.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE		
15	40-150	041.1	451.1
	200-300	042.1	452.1
20	40- 80	043.1	453.1
	100-300	044.1	454.1
25	40- 40	065.1	465.1
	50- 50	066.1	466.1
	80-100	067.1	467.1
	150-300	068.1	468.1
40	50- 50	070.1	469.1
	80- 80	071.1	470.1
	100-100	072.1	471.1
	150-300	073.1	472.1
LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.70.062.1	450	76.81.70.562.1
840	76.81.70.064.1	840	76.81.70.564.1
1230	76.81.70.066.1	1230	76.81.70.566.1
LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.462.1	230	76.83.37.101.1
813	76.80.61.464.1	255	76.83.37.102.1
1219	76.80.61.466.1	305	76.83.37.103.1
1524	76.80.61.468.1	355	76.83.37.105.1
1829	76.80.61.470.1	405	76.83.37.106.1
2134	76.80.61.472.1	455	76.83.37.107.1
2438	76.80.61.474.1		
2743	76.80.61.476.1		
3048	76.80.61.478.1		

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	61.155.1	15	4	1/2	*	70	61.155.1
20	4	5/8	*	80	61.269.1	20	4	5/8	*	80	61.269.1
25	4	5/8	*	80	61.269.1	25	4	5/8	*	90	61.271.1
40	4	3/4	*	90	61.327.1	40	4	3/4	*	100	61.329.1
50	8	5/8	*	90	61.271.1						
80	8	3/4	*	110	61.330.1						
100	8	3/4	*	120	61.332.1						
150	12	3/4	*	130	61.334.1						
200	12	7/8	*	140	61.404.1						
250	16	1	*	160	61.472.1						
300	16	1 1/8	*	170	61.532.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38								
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM			
						15	4	1/2	*	80	61.157.1		
						20	4	5/8	*	90	61.271.1		
						25	4	5/8	*	90	61.271.1		
						40	4	3/4	*	100	61.329.1		
50	8	5/8	*	150	61.281.1	50	8	5/8	*	100	61.273.1		
80	8	3/4	*	150	61.337.1	80	8	3/4	*	120	61.332.1		
100	12	3/4	*	140	61.335.1	100	8	3/4	*	130	61.334.1		
150	12	3/4	*	140	61.335.1	150	12	3/4	*	150	61.337.1		
200	12	7/8	*	150	61.406.1	200	12	7/8	*	170	61.409.1		
250	16	1	*	170	61.474.1	250	16	1	*	190	61.477.1		
300	16	1	1/8	*	190	61.535.1	300	16	1	1/8	*	210	61.538.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.2I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.03.03.103.1
BLIND FLANGE 1 76.65.10.412.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.402.1

* DRAIN POINT DN 20 FIG.2I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.03.03.104.1
BLIND FLANGE 1 76.65.10.414.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.65.80.404.1

* DRAIN POINT DN 20 FIG.2H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.03.03.104.1
BLIND FLANGE 1 76.65.10.414.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.2I DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 2 77.03.03.103.1
GASKET, RF TANGED INSERT 4 85.30.01.104.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 2 76.65.80.402.1

* PRESSURE INSTR.CONN. DN 15 FIG.2I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.03.03.103.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.402.1

* PRESSURE INSTR.CONN. DN 15 FIG.2H DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 1 77.03.03.103.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.155.1
WELDING NECK FLANGE 4 81.38.61.155.1

* METERRUN INSTR. CONN DN 15 FIG.2H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BALL VALVE RED. BORE FLANGED 2 77.03.03.103.1
GASKET, RF TANGED INSERT 4 85.30.01.104.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.412.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.33.03.053.1
STUD BOLT WITH NUTS 8 81.38.61.155.1
WELDING NECK FLANGE 1 76.65.80.402.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.414.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.33.03.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1
WELDING NECK FLANGE 1 76.65.80.404.1

* VENT POINT DN 20 FIG.1H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.414.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.33.03.054.1
STUD BOLT WITH NUTS 8 81.38.61.269.1

CLASS 33050

DESIGN LIMITS										
	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -250	49.6	48.5	44.0	40.9	38.1	35.9	34.0	32.8	31.6	30.7
DN300-300	47.9	47.9	44.0	40.9	38.1	35.9	34.0	32.8	31.6	30.7

- NOTES
- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES												
RUN SIZE	BRANCH SIZE											
	15	20	25	40	50	80	100	150	200	250	300	

300	C	C	C	C	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	A			
150	C	C	C	C	D	D	D	A				
100	C	C	C	C	D	D	A					
80	C	C	C	C	D	A						
50	C	C	C	B	A							
40	C	B	B	A								
25	B	B	A									
20	B	A										
15	A											

TABLE OF SCHEDULES

DN	SCHEDULE

15	40S
20	40S
25	40S
40	40S
50	40S
80	40S
100	40S
150	40S
200	20
250	20
300	20

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
D	PIPE TO PIPE
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 321/347	PLANT :	
CLASS NO. : 33050	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321/347
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP321/347

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F321/347
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F321/347
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F321/347
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP321/347
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP321/347
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F321/347

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP321/347
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321/347
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321/347
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F321/347
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP321/347
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP321/347
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP321/347

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-300	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321/347
MTRR	METER RUN	DN 15- 40	AISI 321/347
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F321/347
STBT	STUD BOLT WITH NUTS	---	ASTM A453-GR.660 CLASS A
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.36.15	018.1	026.1	034.1	050.1	058.1	066.1	074.1	083.1	092.1	104.1	116.1
PIPE NIPPLE 50MM		76.33.57	231.1	241.1	251.1	271.1							
* FLANGES													
BLIND FLANGE		76.65.10	112.1	114.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1
SPECTACLE BLIND FLANGE		76.88.09	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	758.1	762.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	782.1
WELDING NECK FLANGE		76.65.80	182.1	184.1	186.1	188.1	190.1	192.1	194.1	196.1	164.1	166.1	168.1
* FITTINGS													
CAP BUTT-WELD.END		76.33.18	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	186.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.38	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	186.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.39	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	656.1	669.1	686.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	186.1
* VALVES													
CHECK VALVE FLANGED		77.13.20	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED		77.23.20	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GLOBE VALVE FLANGED		77.33.20	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
* MISCELLANEOUS													
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1
METER RUN		76.65.96	812.1	814.1	816.1	818.1							
ORIFICE FLANGE SET		76.65.95					290.1	292.1	194.1	196.1	164.1	166.1	168.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.69.066.1	33.71.066.1	33.85.018.1
25* 15		33.69.076.1	33.71.076.1	33.85.028.1
25* 20		33.69.086.1	33.71.086.1	33.85.038.1
40* 15		33.69.096.1	33.71.096.1	33.85.042.1
40* 20		33.69.116.1	33.71.116.1	33.85.048.1
40* 25		33.69.126.1	33.71.126.1	33.85.058.1
50* 20		33.69.130.1	33.71.130.1	
50* 25		33.69.136.1	33.71.136.1	
50* 40		33.69.146.1	33.71.146.1	33.85.084.1
80* 40		33.69.176.1	33.71.176.1	
80* 50	79.73.634.1	33.69.186.1	33.71.186.1	
100* 40		33.69.192.1	33.71.192.1	
100* 50	79.73.636.1	33.69.206.1	33.71.206.1	
100* 80	79.73.660.1	33.69.216.1	33.71.216.1	
150* 50	79.73.638.1			
150* 80	79.73.662.1	33.69.247.1	33.71.247.1	
150*100	79.73.684.1	33.69.257.1	33.71.257.1	
200* 50	79.73.750.1			
200* 80	79.73.760.1			
200*100	79.73.770.1	33.69.263.1	33.71.263.1	
200*150	79.73.780.1	33.69.275.1		
250* 50	79.73.751.1			
250* 80	79.73.761.1			
250*100	79.73.771.1	33.69.288.1	33.71.288.1	
250*150	79.73.781.1	33.69.290.1		
250*200	79.73.360.1	33.69.305.1	33.71.305.1	
300* 50	79.73.752.1			
300* 80	79.73.762.1			
300*100	79.73.772.1			
300*150	79.73.782.1	33.69.317.1	33.71.317.1	
300*200	79.73.362.1	33.69.328.1	33.71.328.1	
300*250	79.73.378.1	33.69.340.1	33.71.340.1	

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-150	841.1	476.1
	200-300	842.1	477.1
20	40- 80	843.1	478.1
	100-300	844.1	479.1
25	40- 40	845.1	480.1
	50- 50	846.1	481.1
	80-100	847.1	482.1
	150-300	848.1	483.1
40	50- 50	850.1	484.1
	80- 80	851.1	485.1
	100-100	852.1	486.1
	150-300	853.1	487.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
356	76.80.61.862.1		230	76.83.37.101.1
813	76.80.61.864.1		255	76.83.37.102.1
1219	76.80.61.866.1		305	76.83.37.103.1
1524	76.80.61.868.1		355	76.83.37.105.1
1829	76.80.61.870.1		405	76.83.37.106.1
2134	76.80.61.872.1		455	76.83.37.107.1
2438	76.80.61.874.1			
2743	76.80.61.876.1			
3048	76.80.61.878.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	74.155.1	15	4	1/2	*	70	74.155.1
20	4	5/8	*	80	74.269.1	20	4	5/8	*	80	74.269.1
25	4	5/8	*	80	74.269.1	25	4	5/8	*	90	74.271.1
40	4	3/4	*	90	74.327.1	40	4	3/4	*	100	74.329.1
50	8	5/8	*	90	74.271.1						
80	8	3/4	*	110	74.330.1						
100	8	3/4	*	120	74.332.1						
150	12	3/4	*	130	74.334.1						
200	12	7/8	*	140	74.404.1						
250	16	1	*	160	74.472.1						
300	16	1	1/8	*	170	74.532.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38								
DN	NR	INCH	* MM		DN	NR	INCH	* MM					
					15	4	1/2	*	80	74.157.1			
					20	4	5/8	*	90	74.271.1			
					25	4	5/8	*	90	74.271.1			
					40	4	3/4	*	100	74.329.1			
50	8	5/8	*	150	74.281.1	50	8	5/8	*	100	74.273.1		
80	8	3/4	*	150	74.337.1	80	8	3/4	*	120	74.332.1		
100	12	3/4	*	140	74.335.1	100	8	3/4	*	130	74.334.1		
150	12	3/4	*	140	74.335.1	150	12	3/4	*	150	74.337.1		
200	12	7/8	*	150	74.406.1	200	12	7/8	*	170	74.409.1		
250	16	1	*	170	74.474.1	250	16	1	*	190	74.477.1		
300	16	1	1/8	*	190	74.535.1	300	16	1	1/8	*	210	74.538.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.OI DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.112.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.20.053.1
STUD BOLT WITH NUTS 8 81.38.74.155.1
WELDING NECK FLANGE 1 76.65.80.182.1

* DRAIN POINT DN 20 FIG.OI DN 40 - 40
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.114.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.23.20.054.1
STUD BOLT WITH NUTS 8 81.38.74.269.1
WELDING NECK FLANGE 1 76.65.80.184.1

* DRAIN POINT DN 20 FIG.OH DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.114.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GATE VALVE FLANGED 1 77.23.20.054.1
STUD BOLT WITH NUTS 8 81.38.74.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.OI DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.23.20.053.1
LAP-JOINT FLANGE 2 76.65.20.108.1
STUD BOLT WITH NUTS 8 81.38.74.155.1
8 81.38.74.155.1
WELDING NECK FLANGE 2 76.65.80.182.1

* PRESSURE INSTR.CONN. DN 15 FIG.OI DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.20.053.1
LAP-JOINT FLANGE 1 76.65.20.108.1
STUD BOLT WITH NUTS 4 81.38.74.155.1
4 81.38.74.155.1
WELDING NECK FLANGE 1 76.65.80.182.1

* PRESSURE INSTR.CONN. DN 15 FIG.OH DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GATE VALVE FLANGED 1 77.23.20.053.1
LAP-JOINT FLANGE 1 76.65.20.108.1
STUD BOLT WITH NUTS 4 81.38.74.155.1
4 81.38.74.155.1

* METERRUN INSTR. CONN DN 15 FIG.OH DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 4 85.30.01.104.1
GATE VALVE FLANGED 2 77.23.20.053.1
LAP-JOINT FLANGE 2 76.65.20.108.1
STUD BOLT WITH NUTS 8 81.38.74.155.1
8 81.38.74.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.65.60.683.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.74.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.65.60.683.1
GASKET, RF TANGED INSERT 1 85.30.01.112.1
STUD BOLT WITH NUTS 4 81.38.74.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.112.1
GASKET, RF TANGED INSERT 2 85.30.01.104.1
GLOBE VALVE FLANGED 1 77.33.20.053.1
STUD BOLT WITH NUTS 8 81.38.74.155.1
WELDING NECK FLANGE 1 76.65.80.182.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.114.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.33.20.054.1
STUD BOLT WITH NUTS 8 81.38.74.269.1
WELDING NECK FLANGE 1 76.65.80.184.1

* VENT POINT DN 20 FIG.1H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.114.1
GASKET, RF TANGED INSERT 2 85.30.01.106.1
GLOBE VALVE FLANGED 1 77.33.20.054.1
STUD BOLT WITH NUTS 8 81.38.74.269.1

CLASS 33055

DESIGN LIMITS										
TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	300	400	450	500	538
PRESSURE BAR GA										
DN15 -250	49.6	48.5	44.0	40.9	38.1	34.0	31.6	30.7	27.9	24.4
DN300-300	47.9	47.9	44.0	40.9	38.1	34.0	31.6	30.7	27.9	24.4

- NOTES
- -----
 - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES											
RUN SIZE	BRANCH SIZE										
	15	20	25	40	50	80	100	150	200	250	300
300	C	C	C	C	E	E	E	B	B	B	A
250	C	C	C	C	E	E	E	B	B	A	
200	C	C	C	C	E	E	B	B	A		
150	C	C	C	C	E	B	B	A			
100	C	C	C	C	B	B	A				
80	C	C	C	B	B	A					
50	C	C	C	B	A						
40	C	B	B	A							
25	B	B	A								
20	B	A									
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE
15	40S
20	40S
25	40S
40	40S
50	40S
80	40S
100	40S
150	40S
200	20
250	20
300	20

CODE	EXPLANATION OF CHARACTERS
----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 321 STAB HT	PLANT :	
CLASS NO. : 33055	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 33055, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321 STAB HT
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP321 STAB HT

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F321 STAB HT
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F321/347
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F321/347
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP321 STAB HT
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP321 STAB HT
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F321 STAB HT

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP-S-321 STAB HT
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP-S-321 STAB HT
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP-S-321 STAB HT
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP-S-321 STAB HT

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321 STAB HT
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321 STAB HT
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F321 STAB HT
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP-S-321 STAB HT
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP-S-321 STAB HT
		DN 40-250	ASTM A403-WP-S/W-321 STAB HT
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A403-WP-S-321 STAB HT

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321 STAB HT
MTRR	METER RUN	DN 15- 40	AISI 321 STAB HT
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F321 STAB HT
STBT	STUD BOLT WITH NUTS	---	ASTM A453-GR.660 CLASS A
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 321 STAB HT

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 33055, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.36.19	018.1	026.1	034.1	050.1	058.1	066.1	074.1	083.1	092.1	104.1	116.1
PIPE NIPPLE 50MM		76.33.57	031.1	041.1	051.1	071.1							
* FLANGES													
BLIND FLANGE		76.65.08	112.1	114.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1
SPECTACLE BLIND FLANGE		76.88.10	838.1	842.1	846.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1
SPACER RING TYPE (ASME FLANGE)		76.88.15	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1
WELDING NECK FLANGE		76.65.77	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	292.1	294.1	296.1
* FITTINGS													
CAP BUTT-WELD.END		76.33.21	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	186.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	656.1	669.1	686.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.39	786.1	796.1	806.1	826.1	836.1	856.1	876.1	896.1	906.1	919.1	936.1
EQUAL TEE BUTT-WELD ENDS		76.33.83	786.1	796.1	806.1	826.1	836.1	856.1	876.1	896.1	906.1	919.1	936.1
* VALVES													
CHECK VALVE FLANGED		77.13.24	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED		77.23.24	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GLOBE VALVE FLANGED		77.33.24	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
* MISCELLANEOUS													
GASKET, SPIRAL WOUND		85.41.46	404.1	406.1	408.1	412.1	414.1	418.1	370.1	374.1	376.1	378.1	380.1
METER RUN		76.65.97	112.1	114.1	116.1	118.1							
ORIFICE FLANGE SET		76.65.95					776.1	778.1	780.1	782.1	800.1	802.1	804.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.68.566.1	33.74.066.1	33.88.018.1
25* 15		33.68.576.1	33.74.076.1	33.88.028.1
25* 20		33.68.586.1	33.74.086.1	33.88.038.1
40* 15		33.68.596.1	33.74.096.1	33.88.042.1
40* 20		33.68.616.1	33.74.116.1	33.88.048.1
40* 25		33.68.626.1	33.74.126.1	33.88.058.1
50* 20		36.49.103.1	36.64.103.1	
50* 25		33.68.636.1	33.74.136.1	
50* 40		33.68.646.1	33.74.146.1	33.88.084.1
80* 40		33.68.676.1	33.74.176.1	33.88.094.1
80* 50	79.57.634.1	33.68.686.1	33.74.186.1	33.88.104.1
100* 40		36.49.187.1	36.64.187.1	
100* 50	79.57.636.1	33.68.706.1	33.74.206.1	33.88.200.1
100* 80	79.57.660.1	33.68.716.1	33.74.216.1	33.88.228.1
150* 50	79.57.638.1			
150* 80	79.57.662.1	33.68.747.1	33.74.247.1	33.88.256.1
150*100	79.57.684.1	33.68.757.1	33.74.257.1	33.88.284.1
200* 50	79.57.750.1			
200* 80	79.57.760.1			
200*100	79.57.770.1	33.68.765.1	33.74.265.1	33.88.309.1
200*150	79.57.780.1	33.68.775.1	33.74.275.1	33.88.337.1
250* 50	79.57.751.1			
250* 80	79.57.761.1			
250*100	79.57.771.1	36.49.337.1	36.64.337.1	33.88.365.1
250*150	79.57.781.1	33.68.790.1	33.74.290.1	33.88.390.1
250*200	79.57.360.1	33.68.805.1	33.74.305.1	33.88.417.1
300* 50	79.57.752.1			
300* 80	79.57.762.1			
300*100	79.57.772.1			
300*150	79.57.782.1	33.68.821.1	33.74.321.1	33.88.445.1
300*200	79.57.362.1	33.68.828.1	33.74.328.1	33.88.467.1
300*250	79.57.378.1	33.68.840.1	33.74.340.1	33.88.482.1

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-150	681.1	386.1
	200-300	682.1	387.1
20	40- 80	683.1	388.1
	100-300	684.1	389.1
25	40- 40	685.1	390.1
	50- 50	686.1	391.1
	80-100	687.1	392.1
	150-300	688.1	393.1
40	50- 50	690.1	394.1
	80- 80	691.1	395.1
	100-100	692.1	396.1
	150-300	693.1	397.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
356	76.80.61.622.1		230	76.83.37.221.1
813	76.80.61.624.1		255	76.83.37.222.1
1219	76.80.61.626.1		305	76.83.37.223.1
1524	76.80.61.628.1		355	76.83.37.225.1
1829	76.80.61.630.1		405	76.83.37.226.1
2134	76.80.61.632.1		455	76.83.37.227.1
2438	76.80.61.634.1			
2743	76.80.61.636.1			
3048	76.80.61.638.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	74.155.1	15	4	1/2	*	70	74.155.1
20	4	5/8	*	80	74.269.1	20	4	5/8	*	80	74.269.1
25	4	5/8	*	80	74.269.1	25	4	5/8	*	90	74.271.1
40	4	3/4	*	90	74.327.1	40	4	3/4	*	100	74.329.1
50	8	5/8	*	90	74.271.1						
80	8	3/4	*	110	74.330.1						
100	8	3/4	*	120	74.332.1						
150	12	3/4	*	130	74.334.1						
200	12	7/8	*	140	74.404.1						
250	16	1	*	160	74.472.1						
300	16	1 1/8	*	170	74.532.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	80	74.157.1	
					20	4	5/8	*	90	74.271.1	
					25	4	5/8	*	90	74.271.1	
					40	4	3/4	*	100	74.329.1	
50	8	5/8	*	150	74.281.1	50	8	5/8	*	100	74.273.1
80	8	3/4	*	150	74.337.1	80	8	3/4	*	120	74.332.1
100	12	3/4	*	140	74.335.1	100	8	3/4	*	130	74.334.1
150	12	3/4	*	140	74.335.1	150	12	3/4	*	150	74.337.1
200	12	7/8	*	150	74.406.1	200	12	7/8	*	170	74.409.1
250	16	1	*	170	74.474.1	250	16	1	*	190	74.477.1
300	16	1 1/8	*	190	74.535.1	300	16	1 1/8	*	210	74.538.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.112.1
GASKET, SPIRAL WOUND 2 85.41.46.404.1
GATE VALVE FLANGED 1 77.23.24.053.1
STUD BOLT WITH NUTS 8 81.38.74.155.1
WELDING NECK FLANGE 1 76.65.77.220.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.114.1
GASKET, SPIRAL WOUND 2 85.41.46.406.1
GATE VALVE FLANGED 1 77.23.24.054.1
STUD BOLT WITH NUTS 8 81.38.74.269.1
WELDING NECK FLANGE 1 76.65.77.222.1

* DRAIN POINT DN 20 FIG.0H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.114.1
GASKET, SPIRAL WOUND 2 85.41.46.406.1
GATE VALVE FLANGED 1 77.23.24.054.1
STUD BOLT WITH NUTS 8 81.38.74.269.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.404.1
GATE VALVE FLANGED 2 77.23.24.053.1
LAP-JOINT FLANGE 2 76.65.20.108.1
STUD BOLT WITH NUTS 8 81.38.74.155.1
8 81.38.74.155.1
WELDING NECK FLANGE 2 76.65.77.220.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.404.1
GATE VALVE FLANGED 1 77.23.24.053.1
LAP-JOINT FLANGE 1 76.65.20.108.1
STUD BOLT WITH NUTS 4 81.38.74.155.1
4 81.38.74.155.1
WELDING NECK FLANGE 1 76.65.77.220.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.404.1
GATE VALVE FLANGED 1 77.23.24.053.1
LAP-JOINT FLANGE 1 76.65.20.108.1
STUD BOLT WITH NUTS 4 81.38.74.155.1
4 81.38.74.155.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.404.1
GATE VALVE FLANGED 2 77.23.24.053.1
LAP-JOINT FLANGE 2 76.65.20.108.1
STUD BOLT WITH NUTS 8 81.38.74.155.1
8 81.38.74.155.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.65.60.683.1
GASKET, SPIRAL WOUND 1 85.41.46.412.1
STUD BOLT WITH NUTS 4 81.38.74.330.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.221.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.65.60.683.1
GASKET, SPIRAL WOUND 1 85.41.46.412.1
STUD BOLT WITH NUTS 4 81.38.74.330.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.222.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.112.1
GASKET, SPIRAL WOUND 2 85.41.46.404.1
GLOBE VALVE FLANGED 1 77.33.24.053.1
STUD BOLT WITH NUTS 8 81.38.74.155.1
WELDING NECK FLANGE 1 76.65.77.220.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.114.1
GASKET, SPIRAL WOUND 2 85.41.46.406.1
GLOBE VALVE FLANGED 1 77.33.24.054.1
STUD BOLT WITH NUTS 8 81.38.74.269.1
WELDING NECK FLANGE 1 76.65.77.222.1

* VENT POINT DN 20 FIG.1H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.114.1
GASKET, SPIRAL WOUND 2 85.41.46.406.1
GLOBE VALVE FLANGED 1 77.33.24.054.1
STUD BOLT WITH NUTS 8 81.38.74.269.1

CLASS 33091

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-200	0	50	100	125	150

	PRESSURE BAR GA					
DN15 -80	49.6	49.6	47.8	40.7	38.0	29.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0
DN200-300	31.0	31.0	31.0	29.0	23.0	18.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.1, AND LIMITED BY BS5351 BALL VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE										
	15	20	25	40	50	80	100	150	200	250	300
300	C	C	C	C	E	E	E	E	E	E	A
250	C	C	C	C	E	E	E	E	E	E	A
200	C	C	C	C	E	E	E	E	E	A	
150	C	C	C	C	E	E	E	E	A		
100	C	C	C	C	E	E	E	A			
80	C	C	C	C	E	A					
50	C	C	C	C	B	A					
40	C	C	B	B	A						
25	B	B	B	A							
20	B	B	A								
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE

15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	10S
200	10S
250	10S
300	10S

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 304 LT	PLANT :	
CLASS NO. : 33091	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP304
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP304

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F304
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F304
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F304
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP304
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP304
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F304

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP304
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP304
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP304
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP304

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F304
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F304
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F304
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP304
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP304
		DN100-100	ASTM A403-WP304H
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP304

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN150-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-300	GRAPHITE
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F304
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B8 CL.2/A194-8
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE										
			15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.36.03	018.1	026.1	033.1	041.1	057.1	065.1	073.1	082.1	091.1	103.1	115.1
PIPE NIPPLE	50MM	76.33.57	631.1	641.1	649.1	668.1							
* FLANGES													
BLIND FLANGE		76.65.10	712.1	714.1	716.1	718.1	720.1	722.1	724.1	726.1	728.1	730.1	732.1
SPECTACLE BLIND FLANGE		76.88.09	662.1	664.1	666.1	668.1	670.1	672.1	674.1	676.1	678.1	680.1	682.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1	128.1	130.1	132.1
WELDING NECK FLANGE		76.65.79			046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1
		76.65.80	860.1	862.1									
* FITTINGS													
CAP BUTT-WELD.END		76.33.18	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.38	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.40	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1
EQUAL TEE	BUTT-WELD ENDS	76.33.84	536.1	546.1	554.1	574.1	584.1	604.1	624.1	643.1	654.1	667.1	683.1
* VALVES													
BALL VALVE RED. BORE FLANGED		77.03.08	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1	165.1	166.1	
CHECK VALVE FLANGED		77.13.08	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED		77.23.08								064.1	065.1	066.1	067.1
GLOBE VALVE FLANGED		77.33.08	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
* MISCELLANEOUS													
GASKET, RF TANGED INSERT		85.30.01	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1
METER RUN		76.65.96	412.1	414.1	416.1	418.1							
ORIFICE FLANGE SET		76.65.90					078.1	080.1	054.1	056.1	058.1	060.1	062.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.066.1	33.72.066.1	36.90.003.1
25* 15		33.70.079.1	33.72.079.1	36.90.025.1
25* 20		33.70.089.1	33.72.089.1	36.90.041.1
40* 15		33.70.099.1	33.72.099.1	
40* 20		33.70.119.1	33.72.119.1	33.85.132.1
40* 25		33.70.124.1	33.72.124.1	36.90.086.1
50* 20		36.51.090.1	36.66.090.1	
50* 25		33.70.134.1	33.72.134.1	
50* 40		33.70.144.1	33.72.144.1	36.90.136.1
80* 40		33.70.174.1	33.72.174.1	
80* 50	79.60.360.1	33.70.184.1	33.72.184.1	
100* 40		33.70.194.1	33.72.194.1	
100* 50	79.60.362.1	33.70.204.1	33.72.204.1	
100* 80	79.60.386.1	33.70.214.1	33.72.214.1	
150* 50	79.60.364.1			
150* 80	79.60.388.1	33.70.244.1	33.72.244.1	
150*100	79.60.410.1	33.70.254.1	33.72.254.1	
200* 50	79.60.366.1			
200* 80	79.60.390.1			
200*100	79.60.412.1	33.70.264.1	33.72.264.1	
200*150	79.60.432.1	33.70.274.1	33.72.274.1	
250* 50	79.60.368.1			
250* 80	79.60.392.1			
250*100	79.60.414.1	33.70.284.1	33.72.285.1	
250*150	79.60.434.1	33.70.289.1	33.72.289.1	
250*200	79.60.452.1	33.70.303.1	33.72.303.1	
300* 50	79.60.370.1			
300* 80	79.60.394.1			
300*100	79.60.416.1			
300*150	79.60.436.1	33.70.316.1	33.73.316.1	
300*200	79.60.454.1	33.70.327.1	33.72.327.1	
300*250	79.60.470.1	33.70.339.1	33.72.339.1	

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-150	301.1	401.1
	200-300	302.1	402.1
20	40- 80	303.1	403.1
	100-300	304.1	404.1
25	40- 40	265.1	415.1
	50- 50	266.1	416.1
	80-100	267.1	417.1
	150-300	268.1	418.1
40	50- 50	270.1	419.1
	80- 80	271.1	420.1
	100-100	272.1	421.1
	150-300	273.1	422.1

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	70	43.155.1	15	4	1/2	*	70	43.155.1
20	4	5/8	*	80	43.269.1	20	4	5/8	*	80	43.269.1
25	4	5/8	*	80	43.269.1	25	4	5/8	*	90	43.271.1
40	4	3/4	*	90	43.327.1	40	4	3/4	*	100	43.329.1
50	8	5/8	*	90	43.271.1						
80	8	3/4	*	110	43.330.1						
100	8	3/4	*	120	43.332.1						
150	12	3/4	*	130	43.334.1						
200	12	7/8	*	140	43.404.1						
250	16	1	*	160	43.472.1						
300	16	1 1/8	*	170	43.532.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	80	43.157.1	
					20	4	5/8	*	90	43.271.1	
					25	4	5/8	*	90	43.271.1	
					40	4	3/4	*	100	43.329.1	
50	8	5/8	*	150	43.281.1	50	8	5/8	*	100	43.273.1
80	8	3/4	*	150	43.337.1	80	8	3/4	*	120	43.332.1
100	12	3/4	*	140	43.335.1	100	8	3/4	*	130	43.334.1
150	12	3/4	*	140	43.335.1	150	12	3/4	*	150	43.337.1
200	12	7/8	*	150	43.406.1	200	12	7/8	*	170	43.409.1
250	16	1	*	170	43.474.1	250	16	1	*	190	43.477.1
300	16	1 1/8	*	190	43.535.1	300	16	1 1/8	*	210	43.538.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.103.1	
BLIND FLANGE	1	76.65.10.712.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	8	81.38.43.155.1	
WELDING NECK FLANGE	1	76.65.80.860.1	

* DRAIN POINT	DN 20	FIG.2J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.104.1	
BLIND FLANGE	1	76.65.10.714.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
PIPE NIPPLE 50MM	1	76.33.57.641.1	
STUD BOLT WITH NUTS	8	81.38.43.269.1	
WELDING NECK FLANGE	1	76.65.80.862.1	

* DRAIN POINT	DN 20	FIG.2H	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.104.1	
BLIND FLANGE	1	76.65.10.714.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
STUD BOLT WITH NUTS	8	81.38.43.269.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.2I	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.03.08.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.65.20.308.1	
STUD BOLT WITH NUTS	8	81.38.43.155.1	
	8	81.38.43.155.1	
WELDING NECK FLANGE	2	76.65.80.860.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.65.20.308.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	4	81.38.43.155.1	
	4	81.38.43.155.1	
WELDING NECK FLANGE	1	76.65.80.860.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2H	DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.03.08.103.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
LAP-JOINT FLANGE	1	76.65.20.308.1	
STUD BOLT WITH NUTS	4	81.38.43.155.1	
	4	81.38.43.155.1	

* METERRUN INSTR. CONN	DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	2	77.03.08.103.1	
GASKET, RF TANGED INSERT	4	85.30.01.104.1	
LAP-JOINT FLANGE	2	76.65.20.308.1	
STUD BOLT WITH NUTS	8	81.38.43.155.1	
	8	81.38.43.155.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.633.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.43.330.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.633.1	
GASKET, RF TANGED INSERT	1	85.30.01.112.1	
STUD BOLT WITH NUTS	4	81.38.43.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.712.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
GLOBE VALVE FLANGED	1	77.33.08.053.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	8	81.38.43.155.1	
WELDING NECK FLANGE	1	76.65.80.860.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.714.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.33.08.054.1	
PIPE NIPPLE 50MM	1	76.33.57.641.1	
STUD BOLT WITH NUTS	8	81.38.43.269.1	
WELDING NECK FLANGE	1	76.65.80.862.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.714.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
GLOBE VALVE FLANGED	1	77.33.08.054.1	
STUD BOLT WITH NUTS	8	81.38.43.269.1	

CLASS 33100

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	75	100	125	150	175	200
	PRESSURE BAR GA							
DN15 -80	49.6	48.1	45.0	42.2	38.0	29.0	20.0	11.0
DN100-150	41.2	41.2	41.2	39.0	32.0	24.0	17.0	9.0
DN200-300	28.7	28.7	28.7	28.7	23.0	18.0	12.0	7.0

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY BS5351 BALL VALVE RATING
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	15	20	25	40	50	80	100	150
300	C	C	C	C	E	E	E	E
250	C	C	C	C	E	E	E	E
200	C	C	C	C	E	E	E	E
150	C	C	C	C	E	E	E	E
100	C	C	C	C	E	E	E	E
80	C	C	C	C	E	E	E	E
50	C	C	C	B	A			
40	C	B	B	A				
25	B	B	A					
20	B	A						
15	A							

TABLE OF SCHEDULES

DN	SCHEDULE
15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	10S
200	10S
250	10S
300	10S

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 316	PLANT :	
CLASS NO. : 33100	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE,FKM
GAVF	GATE VALVE FLANGED	DN300-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLBF	GLOBE VALVE FLG. BELLOWS SEAL.	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 33100, REV.O PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.36.33	018.1	026.1	033.1	049.1	057.1	065.1	073.1	082.1	091.1	103.1	115.1
PIPE NIPPLE	50MM	76.33.57	931.1	941.1	949.1	968.1							
* FLANGES													
BLIND FLANGE		76.65.10	412.1	414.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1
SPECTACLE BLIND FLANGE		76.88.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1	480.1	482.1
WELDING NECK FLANGE		76.65.79			406.1	408.1	410.1	412.1	414.1	416.1	418.1	420.1	422.1
		76.65.80	402.1	404.1									
* FITTINGS													
CAP BUTT-WELD.END		76.33.19	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	286.1	296.1	304.1	324.1	334.1	354.1	374.1	393.1	404.1	417.1	433.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	786.1	796.1	804.1	824.1	834.1	854.1	874.1	893.1	904.1	917.1	933.1
* VALVES													
BALL VALVE RED. BORE FLANGED		77.03.00	803.1	804.1	805.1	807.1	808.1	810.1	812.1	864.1	865.1	866.1	
CHECK VALVE FLANGED		77.13.17	053.1	054.1	055.1	057.1							
DUAL PL. CHECK VALVE WAFER LUG		77.68.53					558.1	560.1	562.1	564.1	565.1	566.1	567.1
GATE VALVE FLANGED		77.23.18											067.1
GLOBE VALVE FLG. BELLOWS SEAL.		77.33.18	453.1	454.1	455.1	457.1	458.1	460.1	462.1	464.1	465.1		
* MISCELLANEOUS													
GASKET, SPIRAL WOUND		85.41.46	404.1	406.1	408.1	412.1	414.1	418.1	370.1	374.1	376.1	378.1	380.1
METER RUN		76.65.96	412.1	414.1	416.1	418.1							
ORIFICE FLANGE SET		76.65.92					470.1	472.1	264.1	266.1	268.1	270.1	272.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.566.1	33.72.566.1	33.85.618.1
25* 15		33.70.579.1	33.72.579.1	33.85.632.1
25* 20		33.70.589.1	33.72.589.1	33.85.637.1
40* 15		33.70.599.1	33.72.599.1	33.85.643.1
40* 20		33.70.619.1	33.72.619.1	33.85.649.1
40* 25		33.70.624.1	33.72.624.1	33.85.656.1
50* 20		36.50.090.1	36.63.090.1	33.85.665.1
50* 25		33.70.634.1	33.72.634.1	33.85.673.1
50* 40		33.70.644.1	33.72.644.1	33.85.683.1
80* 40		33.70.674.1	33.72.674.1	33.85.693.1
80* 50	79.68.360.1	33.70.684.1	33.72.684.1	33.89.352.1
100* 40		33.70.693.1	33.72.693.1	33.89.360.1
100* 50	79.68.362.1	33.70.704.1	33.72.704.1	33.89.368.1
100* 80	79.68.386.1	33.70.714.1	33.72.714.1	33.89.376.1
150* 50	79.68.364.1			
150* 80	79.68.388.1	33.70.744.1	33.72.744.1	33.89.384.1
150*100	79.68.410.1	33.70.754.1	33.72.754.1	33.89.392.1
200* 50	79.68.366.1			
200* 80	79.68.390.1			
200*100	79.68.412.1	33.70.764.1	33.72.764.1	33.89.400.1
200*150	79.68.432.1	33.70.774.1	33.72.774.1	33.89.408.1
250* 50	79.68.368.1			
250* 80	79.68.392.1			
250*100	79.68.414.1	36.50.250.1	36.63.250.1	33.89.416.1
250*150	79.68.434.1	33.70.789.1	33.72.789.1	33.89.421.1
250*200	79.68.452.1	33.70.803.1	33.72.803.1	33.89.426.1
300* 50	79.68.370.1			
300* 80	79.68.394.1			
300*100	79.68.416.1			
300*150	79.68.436.1	33.70.816.1	33.72.816.1	33.89.431.1
300*200	79.68.454.1	33.70.827.1	33.72.827.1	33.89.436.1
300*250	79.68.470.1	33.70.839.1	33.72.839.1	33.89.441.1

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE		
15	40-150	041.1	451.1
	200-300	042.1	452.1
20	40- 80	043.1	453.1
	100-300	044.1	454.1
25	40- 40	065.1	465.1
	50- 50	066.1	466.1
	80-100	067.1	467.1
	150-300	068.1	468.1
40	50- 50	070.1	469.1
	80- 80	071.1	470.1
	100-100	072.1	471.1
	150-300	073.1	472.1

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	70	15	4	1/2	*	70
20	4	5/8	*	80	20	4	5/8	*	80
25	4	5/8	*	80	25	4	5/8	*	90
40	4	3/4	*	90	40	4	3/4	*	100
50	8	5/8	*	90					
80	8	3/4	*	110					
100	8	3/4	*	120					
150	12	3/4	*	130					
200	12	7/8	*	140					
250	16	1	*	160					
300	16	1 1/8	*	170					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	80
					20	4	5/8	*	90
					25	4	5/8	*	90
					40	4	3/4	*	100
50	8	5/8	*	150	50	8	5/8	*	100
80	8	3/4	*	150	80	8	3/4	*	120
100	12	3/4	*	140	100	8	3/4	*	130
150	12	3/4	*	140	150	12	3/4	*	150
200	12	7/8	*	150	200	12	7/8	*	170
250	16	1	*	170	250	16	1	*	190
300	16	1 1/8	*	190	300	16	1 1/8	*	210

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.03.00.803.1	
BLIND FLANGE		1	76.65.10.412.1	
GASKET, SPIRAL WOUND		2	85.41.46.404.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
WELDING NECK FLANGE		1	76.65.80.402.1	

* DRAIN POINT		DN 20	FIG.2I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.03.00.804.1	
BLIND FLANGE		1	76.65.10.414.1	
GASKET, SPIRAL WOUND		2	85.41.46.406.1	
STUD BOLT WITH NUTS		8	81.38.61.269.1	
WELDING NECK FLANGE		1	76.65.80.404.1	

* DRAIN POINT		DN 20	FIG.2H	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.03.00.804.1	
BLIND FLANGE		1	76.65.10.414.1	
GASKET, SPIRAL WOUND		2	85.41.46.406.1	
STUD BOLT WITH NUTS		8	81.38.61.269.1	

* ORIFICE INSTR.CONN.		DN 15	FIG.2I	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		2	77.03.00.803.1	
GASKET, SPIRAL WOUND		4	85.41.46.404.1	
LAP-JOINT FLANGE		2	76.62.20.308.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
WELDING NECK FLANGE		2	76.65.80.402.1	

* PRESSURE INSTR.CONN.		DN 15	FIG.2I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.03.00.803.1	
GASKET, SPIRAL WOUND		2	85.41.46.404.1	
LAP-JOINT FLANGE		1	76.62.20.308.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
WELDING NECK FLANGE		4	81.38.61.155.1	
		1	76.65.80.402.1	

* PRESSURE INSTR.CONN.		DN 15	FIG.2H	DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		1	77.03.00.803.1	
GASKET, SPIRAL WOUND		2	85.41.46.404.1	
LAP-JOINT FLANGE		1	76.62.20.308.1	
STUD BOLT WITH NUTS		4	81.38.61.155.1	
		4	81.38.61.155.1	

* METERRUN INSTR. CONN		DN 15	FIG.2H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED		2	77.03.00.803.1	
GASKET, SPIRAL WOUND		4	85.41.46.404.1	
LAP-JOINT FLANGE		2	76.62.20.308.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
		8	81.38.61.155.1	

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.533.1	
GASKET, SPIRAL WOUND		1	85.41.46.412.1	
STUD BOLT WITH NUTS		4	81.38.61.330.1	
THERMOWELL STRAIGHT		L=230 MM	1	76.83.37.101.1

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.533.1	
GASKET, SPIRAL WOUND		1	85.41.46.412.1	
STUD BOLT WITH NUTS		4	81.38.61.330.1	
THERMOWELL STRAIGHT		L=255 MM	1	76.83.37.102.1

* VENT POINT		DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.65.10.412.1	
GASKET, SPIRAL WOUND		2	85.41.46.404.1	
GLOBE VALVE FLG. BELLOWS SEAL.		1	77.33.18.453.1	
STUD BOLT WITH NUTS		8	81.38.61.155.1	
WELDING NECK FLANGE		1	76.65.80.402.1	

* VENT POINT		DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.65.10.414.1	
GASKET, SPIRAL WOUND		2	85.41.46.406.1	
GLOBE VALVE FLG. BELLOWS SEAL.		1	77.33.18.454.1	
STUD BOLT WITH NUTS		8	81.38.61.269.1	
WELDING NECK FLANGE		1	76.65.80.404.1	

* VENT POINT		DN 20	FIG.1H	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.65.10.414.1	
GASKET, SPIRAL WOUND		2	85.41.46.406.1	
GLOBE VALVE FLG. BELLOWS SEAL.		1	77.33.18.454.1	
STUD BOLT WITH NUTS		8	81.38.61.269.1	

CLASS 36071

DESIGN LIMITS								
TEMPERATURE IN DEGREES CELSIUS								
	0	50	75	100	125	150	175	200
PRESSURE BAR GA								
DN15 -80	49.6	48.1	45.0	42.2	38.0	29.0	20.0	11.0
DN100-150	42.0	42.0	42.0	39.0	32.0	24.0	17.0	9.0

- NOTES
- -----
 - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2, AND LIMITED BY BS5351 BALL VALVE RATING
 - BENDING OF PIPE IS ALLOWED, BUT HEAT TREATMENT (SOLUTION ANNEAL) IS REQUIRED WHEN COLD DEFORMATION IS > 15%.
 - BLIND FLANGES TO BE PROVIDED WITH LINER.

BRANCH CONNECTIONS 90 DEGREES									
RUN SIZE	BRANCHSIZE								
	15	20	25	40	50	80	100	150	
150	C	C	C	C	E	B	B	A	
100	C	C	C	B	B	B	A		
80	C	C	C	B	B	A			
50	C	B	B	B	A				
40	B	B	B	A					
25	B	B	A						
20	B	A							
15	A								

TABLE OF SCHEDULES	
DN	SCHEDULE
15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	10S

CODE	EXPLANATION OF CHARACTERS
----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			
NI ALLOY	(HASTELLOY B2)	PLANT	:
CLASS NO.	: 36071	CONSIGNEE	:
ANS RATING	: CLASS 300	ENGINEERED BY	:
CORR. ALL.	: 0 mm.	PRINCIPAL	:
REV. LETTER	: O	CONTR.JOB NO.	:
REV. DATE	: 09/96	PROJECT NO.	:

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 36071, REV.O PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15- 80	ASTM B622 UNS N10665
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM B622 UNS N10665

* FLANGES

BLFL	BLIND FLANGE	DN 15-150	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
FLIN	BLIND FLANGE LINER	DN 15-150	ASTM B333 UNS N10665
LJFL	LAP-JOINT FLANGE	DN 15-150	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-150	ASTM B366-WPHB2-S
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM B366-WPHB2-S/W
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM B366-WPHB2-S/W
STBE	STUB-END	DN 15-150	ASTM B366-WPHB2-S/W
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM B366-WPHB2-S/W

* REDUCING FITTINGS

BROB	BRANCH OUTLET RED. BUTT WELD	DN150-150	ASTM B366 UNS N10665
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM B366-WPHB2-S/W
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM B366-WPHB2-S/W
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM B366-WPHB2-S/W

* VALVES

BARF	BALL VALVE RED. BORE FLANGED	DN 15-150	BODY: ASTM A494-N-12MV-CL 2 TRIM: ASTM B335, PTFE
CHVF	CHECK VALVE FLANGED	DN 15-150	BODY: ASTM A494-N-12MV-CL 2 TRIM: ASTM B335
GAVF	GATE VALVE FLANGED	DN 15-150	BODY: ASTM A494-N-12MV-CL 2 TRIM: BODY MAT,ASTM B335
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A494-N-12MV-CL 2 TRIM: BODY MAT,ASTM B335

* MISCELLANEOUS

GKRF	GASKET, RAISED FACE	DN 15-150	PTFE REINF.WITH MINERAL FILLER
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	STEM : ASTM B335 UNS N10665 FLANGE: ASTM B333 UNS N10665

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE							
			15	20	25	40	50	80	100	150

* PIPE										
PIPE		74.78.35	118.1	126.1	133.1	149.1	157.1	165.1	273.1	282.1
PIPE NIPPLE 50MM		76.28.57	781.1	791.1	801.1	816.1				
* FLANGES										
BLIND FLANGE		76.62.11	108.1	112.1	116.1	118.1	120.1	122.1	124.1	126.1
BLIND FLANGE LINER		76.80.81	961.1	962.1	963.1	965.1	966.1	967.1	968.1	970.1
LAP-JOINT FLANGE		76.65.20	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1
* FITTINGS										
CAP BUTT-WELD.END		76.28.17	436.1	446.1	454.1	474.1	484.1	504.1	524.1	544.1
ELBOW 45 DEG BUTT-WELD ENDS		76.28.37	436.1	446.1	454.1	474.1	484.1	504.1	524.1	544.1
ELBOW 90 DEG BUTT-WELD ENDS		76.28.42	236.1	246.1	254.1	274.1	248.1	304.1	324.1	344.1
STUB-END		76.28.54	436.1	446.1	454.1	474.1	484.1	504.1	524.1	544.1
EQUAL TEE BUTT-WELD ENDS		76.28.87	236.1	246.1	254.1	274.1	284.1	304.1	324.1	344.1
* VALVES										
BALL VALVE RED. BORE FLANGED		77.06.10	103.1	104.1	105.1	107.1	108.1	110.1	112.1	164.1
CHECK VALVE FLANGED		77.16.10	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1
GATE VALVE FLANGED		77.26.10	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1
GLOBE VALVE FLANGED		77.36.10	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1
* MISCELLANEOUS										
GASKET, RAISED FACE		85.48.74	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		28.67.266.1	28.75.266.1	28.91.018.1
25* 15		28.67.279.1	28.75.279.1	28.91.032.1
25* 20		28.67.289.1	28.75.289.1	28.91.037.1
40* 15		28.67.299.1	28.75.299.1	
40* 20		28.67.319.1	28.75.319.1	28.91.047.1
40* 25		28.67.324.1	28.75.324.1	28.91.071.1
50* 20		28.67.331.1	28.75.331.1	
50* 25		28.67.334.1	28.75.334.1	28.91.072.1
50* 40		28.67.344.1	28.75.344.1	28.91.083.1
80* 40		28.67.374.1	28.75.374.1	28.91.090.1
80* 50		28.67.384.1	28.75.384.1	28.91.093.1
100* 40		28.67.394.1	28.75.394.1	
100* 50		28.67.404.1	28.75.404.1	28.91.096.1
100* 80		28.67.414.1	28.75.414.1	28.91.099.1
150* 50	77.85.438.1			
150* 80		28.67.444.1	28.75.444.1	28.91.102.1
150*100		28.67.454.1	28.75.454.1	28.91.105.1

		BNIP
		76.80.31
BRANCH	RUN-PIPE	
15	40-150	882.1
20	40-150	886.1
25	40- 40	889.1
	50- 50	890.1
	80-100	891.1
	150-150	892.1
40	50- 50	894.1
	80- 80	895.1
	100-100	896.1
	150-150	897.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.131.1
255	76.83.37.132.1
305	76.83.37.133.1
355	76.83.37.135.1
405	76.83.37.136.1
455	76.83.37.137.1

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET FOR LAP FLANGES

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 70	15	4	1/2	* 70
20	4	5/8	* 80	20	4	5/8	* 90
25	4	5/8	* 80	25	4	5/8	* 90
40	4	3/4	* 90	40	4	3/4	* 100
50	8	5/8	* 90	50	8	5/8	* 100
80	8	3/4	* 110	80	8	3/4	* 120
100	8	3/4	* 120	100	8	3/4	* 130
150	12	3/4	* 130	150	12	3/4	* 130

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.2V	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.06.10.103.1	
BLIND FLANGE	1	76.62.11.108.1	
BLIND FLANGE LINER	1	76.80.81.961.1	
GASKET, RAISED FACE	2	85.48.74.104.1	
LAP-JOINT FLANGE	1	76.65.20.508.1	
STUB-END	1	76.28.54.436.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	

* DRAIN POINT	DN 20	FIG.2V	DN 40 -150
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.06.10.104.1	
BLIND FLANGE	1	76.62.11.112.1	
BLIND FLANGE LINER	1	76.80.81.962.1	
GASKET, RAISED FACE	2	85.48.74.106.1	
LAP-JOINT FLANGE	1	76.65.20.512.1	
STUB-END	1	76.28.54.446.1	
STUD BOLT WITH NUTS	4	81.38.61.269.1	
	4	81.38.61.271.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.2V	DN 15 -150
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BALL VALVE RED. BORE FLANGED	1	77.06.10.103.1	
GASKET, RAISED FACE	2	85.48.74.104.1	
LAP-JOINT FLANGE	2	76.65.20.508.1	
STUB-END	1	76.28.54.436.1	
STUD BOLT WITH NUTS	8	81.38.61.155.1	

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* TEMPERATURE INSTR.C.	DN 40	FIG.AS	DN 80 - 80
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RAISED FACE	1	85.48.74.112.1	
LAP-JOINT FLANGE	1	76.65.20.518.1	
PIPE	0	74.78.35.149.1	
STUB-END	1	76.28.54.474.1	
STUD BOLT WITH NUTS	4	81.38.61.329.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.131.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BS	DN100 -150
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.533.1	
GASKET, RAISED FACE	1	85.48.74.112.1	
LAP-JOINT FLANGE	1	76.65.20.518.1	
PIPE	0	74.78.35.149.1	
STUB-END	1	76.28.54.474.1	
STUD BOLT WITH NUTS	4	81.38.61.329.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.132.1	

* VENT POINT	DN 15	FIG.1V	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.108.1	
BLIND FLANGE LINER	1	76.80.81.961.1	
GASKET, RAISED FACE	2	85.48.74.104.1	
GLOBE VALVE FLANGED	1	77.36.10.053.1	
LAP-JOINT FLANGE	1	76.65.20.508.1	
STUB-END	1	76.28.54.436.1	
STUD BOLT WITH NUTS	4	81.38.61.155.1	
	4	81.38.61.155.1	

* VENT POINT	DN 20	FIG.1V	DN 40 -150
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.11.112.1	
BLIND FLANGE LINER	1	76.80.81.962.1	
GASKET, RAISED FACE	2	85.48.74.106.1	
GLOBE VALVE FLANGED	1	77.36.10.054.1	
LAP-JOINT FLANGE	1	76.65.20.512.1	
STUB-END	1	76.28.54.446.1	
STUD BOLT WITH NUTS	4	81.38.61.269.1	
	4	81.38.61.271.1	

CLASS 36080

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS				
	0	50	100	150	200

	PRESSURE BAR GA				
DN15 -200	35.0	34.0	31.0	29.0	28.0

- NOTES
-
- DESIGN LIMITS ACC.TO PLUG VALVE RATING
 - FOR REQUIREMENTS REGARDING HYDROGEN FLUORIDE SERVICE, SEE DEP 31.38.01.11-GEN
 - ALL WELDS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN AND DEP 31.38.01.31-GEN
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - DN15-20 PIPING COMPONENTS ONLY TO BE USED FOR SHORT BRANCHES E.G. PRESSURE POINTS

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE								
	15	20	25	40	50	80	100	150	200

200	C	C	C	C	E	E	B	B	A
150	C	C	C	C	E	B	B	A	
100	C	C	C	C	B	B	A		
80	C	C	C	C	B	A			
50	C	C	B	B	A				
40	C	B	B	A					
25	B	B	A						
20	B	A							
15	A								

TABLE OF SCHEDULES

DN	SCHEDULE

15	40S
20	40S
25	10S
40	10S
50	10S
80	10S
100	10S
150	40S
200	40S

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

NI-CU ALLOY (MONEL 400) PWHT	PLANT :	
CLASS NO. : 36080	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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* PIPE

PIPE	PIPE	DN 15-200	ASTM B165	UNS N04400
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM B165	UNS N04400

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM B564	UNS N04400
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105	
LJFL	LAP-JOINT FLANGE	---	ASTM A105	
SBFL	SPECTACLE BLIND FLANGE	DN 15-200	ASTM B127	UNS N04400
WNFL	WELDING NECK FLANGE	DN 15-200	ASTM B564	UNS N04400

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-200	ASTM B366-WPNC-S	
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM B366-WPNC-S/W	
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM B366-WPNC-S/W	
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM B366-WPNC-S/W	

* REDUCING FITTINGS

BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM B564	UNS N04400
BROB	BRANCH OUTLET RED. BUTT WELD	DN150-200	ASTM B564	UNS N04400
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM B366-WPNC-S/W	
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM B366-WPNC-S/W	
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM B366-WPNC-S/W	

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: MONEL 400	UNS N04400
			TRIM: MONEL 400	
GAVF	GATE VALVE FLANGED	DN 50-200	BODY: MONEL 400	UNS N04400
			TRIM: MONEL 400	
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: MONEL 400	UNS N04400
			TRIM: MONEL 400	
PLVF	PLUG VALVE FLANGED	DN 15-200	BODY: MONEL 400	UNS N04400
			TRIM: MONEL 400/PTFE	

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-200	MONEL 400,PTFE FILLED	
			CS CENTRING/PTFE INNER RING	
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM	
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400	

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE								
			15	20	25	40	50	80	100	150	200

* PIPE											
PIPE		74.78.50	219.1	227.1	233.1	249.1	257.1	265.1	273.1	284.1	295.1
PIPE NIPPLE	50MM	76.28.57	431.1	441.1	461.1	481.1					
* FLANGES											
BLIND FLANGE		76.60.00	278.1	279.1	280.1	282.1	283.1	285.1	287.1	289.1	290.1
SPECTACLE BLIND FLANGE		76.88.25	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1
WELDING NECK FLANGE		76.60.83	511.1	512.1	491.1	493.1	494.1	496.1	498.1	521.1	522.1
* FITTINGS											
CAP BUTT-WELD.END		76.28.16	036.1	046.1	054.1	074.1	084.1	104.1	124.1	146.1	156.1
ELBOW 45 DEG BUTT-WELD ENDS		76.28.36	036.1	046.1	054.1	074.1	084.1	104.1	124.1	146.1	156.1
ELBOW 90 DEG BUTT-WELD ENDS		76.28.41	036.1	046.1	054.1	074.1	084.1	104.1	124.1	146.1	156.1
EQUAL TEE BUTT-WELD ENDS		76.28.86	036.1	046.1	054.1	074.1	084.1	104.1	124.1	146.1	156.1
* VALVES											
CHECK VALVE FLANGED		77.16.22	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1
GATE VALVE FLANGED		77.26.20					458.1	460.1	462.1	464.1	465.1
GLOBE VALVE FLANGED		77.36.22	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1
PLUG VALVE FLANGED		77.72.62	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1
* MISCELLANEOUS											
GASKET, SPIRAL WOUND		85.43.44	704.1	706.1	708.1	712.1	714.1	718.1	620.1	624.1	626.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		28.65.066.1	28.73.066.1	28.91.518.1
25* 15		28.65.079.1	28.73.079.1	28.91.532.1
25* 20		28.65.089.1	28.73.089.1	28.91.537.1
40* 15		28.65.099.1	28.73.099.1	
40* 20		28.65.119.1	28.73.119.1	28.91.547.1
40* 25		28.65.124.1	28.73.124.1	28.91.572.1
50* 20		28.65.131.1	28.73.131.1	
50* 25		28.65.134.1	28.73.134.1	28.91.582.1
50* 40		28.65.144.1	28.73.144.1	28.91.583.1
80* 40		28.65.174.1	28.73.174.1	
80* 50		28.65.184.1	28.73.184.1	28.91.602.1
100* 40		28.65.194.1	28.73.194.1	
100* 50		28.65.204.1	28.73.204.1	28.91.618.1
100* 80		28.65.214.1	28.73.214.1	28.91.626.1
150* 50	77.57.752.1			
150* 80		28.65.247.1	28.73.247.1	28.91.636.1
150*100		28.65.257.1	28.73.257.1	28.91.644.1
200* 50	77.57.754.1			
200* 80	77.57.764.1			
200*100		28.65.267.1	28.73.267.1	28.91.661.1
200*150		28.65.276.1	28.73.276.1	28.91.681.1

COMP.	
NAME	DESCRIPTION
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIP	
		76.80.30	76.80.31
BRANCH	RUN-PIPE		
15	40-150	102.1	
	200-200	104.1	
20	40- 80	106.1	
	100-200	108.1	
25	40- 40		753.1
	50- 50		754.1
	80-100		755.1
	150-200		756.1
40	50- 50		757.1
	80- 80		758.1
	100-100		759.1
	150-200		760.1

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.121.1
255	76.83.37.122.1
305	76.83.37.123.1
355	76.83.37.125.1
405	76.83.37.126.1
455	76.83.37.127.1

BOLTING
BOLTSET FLANGED JOINTS

81.38					
DN	NR	INCH	*	MM	
15	4	1/2	*	70	66.155.1
20	4	5/8	*	80	66.269.1
25	4	5/8	*	80	66.269.1
40	4	3/4	*	90	66.327.1
50	8	5/8	*	90	66.271.1
80	8	3/4	*	110	66.330.1
100	8	3/4	*	120	66.332.1
150	12	3/4	*	130	66.334.1
200	12	7/8	*	140	66.404.1

ASSEMBLIES

* PRESSURE INSTR.CONN. DN 15 FIG.4I DN 15 -200
 Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
 GASKET, SPIRAL WOUND 2 85.43.44.704.1
 LAP-JOINT FLANGE 1 76.62.20.308.1
 PLUG VALVE FLANGED 1 77.72.62.053.1
 STUD BOLT WITH NUTS 4 81.38.66.155.1
 4 81.38.66.155.1
 WELDING NECK FLANGE 1 76.60.83.511.1

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* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
 Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
 COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
 GASKET, SPIRAL WOUND 1 85.43.44.712.1
 STUD BOLT WITH NUTS 4 81.38.66.330.1
 THERMOWELL STRAIGHT L=230 MM 1 76.83.37.121.1

 * TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -200
 Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
 COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.533.1
 GASKET, SPIRAL WOUND 1 85.43.44.712.1
 STUD BOLT WITH NUTS 4 81.38.66.330.1
 THERMOWELL STRAIGHT L=255 MM 1 76.83.37.122.1

PIPING CLASSES ASME RATING 600

CLASS 61011

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400
		PRESSURE BAR GA								
DN15	-600	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	69.1

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40 80
350	C	C	C	C	E	E	E	E	E	E	E	A					50 80
300	C	C	C	C	E	E	E	E	E	E	A						80 80
250	C	C	C	C	E	E	E	E	E	A							100 80
200	C	C	C	C	E	E	E	E	A								150 80
150	C	C	C	C	E	E	E	A									200 80
100	C	C	C	C	E	E	A										250 80
80	C	C	C	C	E	A											300 80
50	C	C	C	B	A												350 80
40	C	B	B	A													400 80
25	B	B	A														450 80
20	B	A															500 80
15	A																600 80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 61011	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 61011, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-350	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-200	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN400-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVS	GATE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
ITEM DESCRIPTION	MESC																	

* PIPE																		
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	071.1	109.1	157.1			295.1	341.1	391.1					
PIPE (API 5L-B, EW)	74.13.14								219.1	255.1								
PIPE (API 5L-B, SAW)	74.13.17													445.1	492.1	546.1	593.1	
PIPE	74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1	
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1													
* FLANGES																		
BLIND FLANGE	76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1	
SPECTACLE BLIND FLANGE	76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1	
WELDING NECK FLANGE	76.62.79	752.1	754.1	756.1	758.1	760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1	
* FITTINGS																		
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1	264.1	284.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1	
* VALVES																		
CHECK VALVE FLANGED	77.10.05	103.1	104.1	105.1	107.1													
	77.10.20					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1	
CHECK VALVE SOCKET WELD	77.11.04	003.1	004.1	005.1	007.1													
GATE VALVE FLANGED	77.20.04	103.1	104.1	105.1	107.1													
	77.20.20					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1	
GATE VALVE SOCKET WELD	77.21.04	003.1	004.1	005.1	007.1													
GLOBE VALVE FLANGED	77.30.05	103.1	104.1	105.1	107.1													
	77.30.20					108.1	110.1	112.1	114.1									
GLOBE VALVE SOCKET WELD	77.31.04	003.1	004.1	005.1	007.1													
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND	85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1	
METER RUN	76.65.96	272.1	274.1	276.1	278.1													
ORIFICE FLANGE SET	76.62.95					760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.01.374.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.01.398.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.01.420.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1	450* 50	79.01.376.1			
80* 40		30.72.227.1	30.73.227.1	30.89.124.1	450* 80	79.01.400.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.422.1			
100* 40		30.72.251.1	30.73.251.1		450*150	79.01.442.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.01.364.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.01.366.1				500* 50	79.01.378.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.01.444.1			
250* 50	79.01.368.1				500*200	79.01.462.1	29.46.904.1	29.61.904.1	30.89.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.72.636.1	30.73.636.1	30.89.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.01.492.1	30.72.646.1	30.73.646.1	30.89.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.01.504.1	30.72.677.1	30.73.677.1	30.89.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.01.514.1	30.72.707.1	30.73.707.1	30.89.798.1
300* 50	79.01.370.1				500*450	79.01.522.1	30.72.737.1	30.73.737.1	30.89.822.1
300* 80	79.01.394.1				600* 50	79.01.382.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.01.466.1			
350* 50	79.01.372.1				600*250	79.01.482.1	30.72.805.1	30.73.805.1	30.89.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.72.825.1	30.73.825.1	30.89.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.72.845.1	30.73.845.1	30.89.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.01.518.1	30.72.887.1	30.73.887.1	30.89.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.01.526.1	30.72.917.1	30.73.917.1	30.89.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.01.532.1	30.72.947.1	30.73.947.1	30.89.966.1
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	201.1	001.1
	200-600	202.1	002.1
20	40- 80	203.1	003.1
	100-600	204.1	004.1
25	40- 40	205.1	005.1
	50- 50	206.1	006.1
	80-100	207.1	007.1
	150-600	208.1	008.1
40	50- 50	210.1	009.1
	80- 80	211.1	010.1
	100-100	212.1	011.1
	150-300	213.1	013.1
	350-600	214.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.072.1	450	76.81.65.572.1
840	76.81.65.074.1	840	76.81.65.574.1
1230	76.81.65.076.1	1230	76.81.65.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.082.1	230	76.83.37.101.1
813	76.80.60.084.1	255	76.83.37.102.1
1219	76.80.60.086.1	305	76.83.37.103.1
1524	76.80.60.088.1	355	76.83.37.105.1
1829	76.80.60.090.1	405	76.83.37.106.1
2134	76.80.60.092.1	455	76.83.37.107.1
2438	76.80.60.094.1		
2743	76.80.60.096.1		
3048	76.80.60.098.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	80	15	4	1/2	*	80
20	4	5/8	*	90	20	4	5/8	*	90
25	4	5/8	*	90	25	4	5/8	*	90
40	4	3/4	*	110	40	4	3/4	*	110
50	8	5/8	*	110					
80	8	3/4	*	130					
100	8	7/8	*	150					
150	12	1	*	170					
200	12	1 1/8	*	190					
250	16	1 1/4	*	220					
300	20	1 1/4	*	220					
350	20	1 3/8	*	240					
400	20	1 1/2	*	250					
450	20	1 5/8	*	280					
500	24	1 5/8	*	290					
600	24	1 7/8	*	330					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230
250	16	1 1/4	*	230	250	16	1 1/4	*	260
300	20	1 1/4	*	240	300	20	1 1/4	*	270
350	20	1 3/8	*	260	350	20	1 3/8	*	290
400	20	1 1/2	*	280	400	20	1 1/2	*	310
450	20	1 5/8	*	300	450	20	1 5/8	*	340
500	24	1 5/8	*	320	500	24	1 5/8	*	360
600	24	1 7/8	*	360	600	24	1 7/8	*	420

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* DRAIN POINT	DN 20	FIG.0E	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE SOCKET WELD	1	77.21.04.004.1	
PIPE NIPPLE 50MM	2	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

* DRAIN POINT	DN 20	FIG.0D	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE SOCKET WELD	1	77.21.04.004.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0D	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE SOCKET WELD	2	77.21.04.003.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	2	76.62.79.752.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0D	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE SOCKET WELD	1	77.21.04.003.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.04.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.003.1	
PIPE NIPPLE 50MM	2	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* VENT POINT	DN 20	FIG.1E	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.004.1	
PIPE NIPPLE 50MM	2	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

* VENT POINT	DN 20	FIG.1D	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE SOCKET WELD	1	77.31.04.004.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

CLASS 61013

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	102.0	100.1	92.7	90.6	87.8	83.6	77.5	73.9	69.1

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	B	A												350 80
40	C	B	B	A													400 80
25	B	B	A														450 80
20	B	A															500 80
15	A																600 80

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT	PLANT	:	
CLASS NO. : 61013		CONSIGNEE	:	
ANS RATING : CLASS 600		ENGINEERED BY :		
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : B		CONTR.JOB NO. :		
REV. DATE : 12/98		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
SPECTACLE BLIND FLANGE		76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
WELDING NECK FLANGE		76.62.79	752.1	754.1	756.1	758.1	760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1	264.1	284.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
* VALVES																		
CHECK VALVE FLANGED		77.10.12	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.20.36	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE FLANGED		77.30.12	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	272.1	274.1	276.1	278.1												
ORIFICE FLANGE SET		76.62.96					190.1	192.1	194.1	196.1	198.1	200.1	202.1	204.1	206.1	208.1	210.1	212.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.01.374.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.01.398.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.01.420.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1	450* 50	79.01.376.1			
80* 40		30.72.227.1	30.73.227.1	30.89.124.1	450* 80	79.01.400.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.422.1			
100* 40		30.72.251.1	30.73.251.1		450*150	79.01.442.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.01.364.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.01.366.1				500* 50	79.01.378.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.01.444.1			
250* 50	79.01.368.1				500*200	79.01.462.1	29.46.904.1	29.61.904.1	30.89.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.72.636.1	30.73.636.1	30.89.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.01.492.1	30.72.646.1	30.73.646.1	30.89.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.01.504.1	30.72.677.1	30.73.677.1	30.89.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.01.514.1	30.72.707.1	30.73.707.1	30.89.798.1
300* 50	79.01.370.1				500*450	79.01.522.1	30.72.737.1	30.73.737.1	30.89.822.1
300* 80	79.01.394.1				600* 50	79.01.382.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.01.466.1			
350* 50	79.01.372.1				600*250	79.01.482.1	30.72.805.1	30.73.805.1	30.89.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.72.825.1	30.73.825.1	30.89.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.72.845.1	30.73.845.1	30.89.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.01.518.1	30.72.887.1	30.73.887.1	30.89.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.01.526.1	30.72.917.1	30.73.917.1	30.89.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.01.532.1	30.72.947.1	30.73.947.1	30.89.966.1
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	201.1	001.1
	200-600	202.1	002.1
20	40- 80	203.1	003.1
	100-600	204.1	004.1
25	40- 40	205.1	005.1
	50- 50	206.1	006.1
	80-100	207.1	007.1
	150-600	208.1	008.1
40	50- 50	210.1	009.1
	80- 80	211.1	010.1
	100-100	212.1	011.1
	150-300	213.1	013.1
	350-600	214.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.172.1	450	76.81.65.672.1
840	76.81.65.174.1	840	76.81.65.674.1
1230	76.81.65.176.1	1230	76.81.65.676.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.59.082.1	230	76.83.37.101.1
813	76.80.59.084.1	255	76.83.37.102.1
1219	76.80.59.086.1	305	76.83.37.103.1
1524	76.80.59.088.1	355	76.83.37.105.1
1829	76.80.59.090.1	405	76.83.37.106.1
2134	76.80.59.092.1	455	76.83.37.107.1
2438	76.80.59.094.1		
2743	76.80.59.096.1		
3048	76.80.59.098.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	* 80	61.157.1	15	4	1/2	* 80	61.157.1
20	4	5/8	* 90	61.271.1	20	4	5/8	* 90	61.271.1
25	4	5/8	* 90	61.271.1	25	4	5/8	* 90	61.271.1
40	4	3/4	* 110	61.330.1	40	4	3/4	* 110	61.330.1
50	8	5/8	* 110	61.274.1					
80	8	3/4	* 130	61.334.1					
100	8	7/8	* 150	61.406.1					
150	12	1	* 170	61.474.1					
200	12	1 1/8	* 190	61.535.1					
250	16	1 1/4	* 220	61.597.1					
300	20	1 1/4	* 220	61.597.1					
350	20	1 3/8	* 240	61.646.1					
400	20	1 1/2	* 250	61.688.1					
450	20	1 5/8	* 280	61.722.1					
500	24	1 5/8	* 290	61.724.1					
600	24	1 7/8	* 330	61.786.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
						15	4	1/2	*	90	61.159.1
						20	4	5/8	*	100	61.273.1
						25	4	5/8	*	100	61.273.1
						40	4	3/4	*	120	61.332.1
50	8	5/8	*	150	61.281.1	50	8	5/8	*	120	61.276.1
80	8	3/4	*	150	61.337.1	80	8	3/4	*	150	61.337.1
100	8	7/8	*	160	61.407.1	100	8	7/8	*	170	61.409.1
150	12	1	*	180	61.475.1	150	12	1	*	210	61.480.1
200	12	1 1/8	*	210	61.538.1	200	12	1 1/8	*	230	61.541.1
250	16	1 1/4	*	230	61.598.1	250	16	1 1/4	*	260	61.603.1
300	20	1 1/4	*	240	61.600.1	300	20	1 1/4	*	270	61.605.1
350	20	1 3/8	*	260	61.649.1	350	20	1 3/8	*	290	61.654.1
400	20	1 1/2	*	280	61.693.1	400	20	1 1/2	*	310	61.698.1
450	20	1 5/8	*	300	61.725.1	450	20	1 5/8	*	340	61.732.1
500	24	1 5/8	*	320	61.728.1	500	24	1 5/8	*	360	61.736.1
600	24	1 7/8	*	360	61.791.1	600	24	1 7/8	*	420	61.802.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.36.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.36.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.36.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.36.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	
WELDING NECK FLANGE	2	76.62.79.752.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.36.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.36.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.36.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.30.12.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* VENT POINT	DN 15	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.30.12.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.12.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

CLASS 61015

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	99.1	97.7	92.7	90.6	87.8	83.6	77.5	73.9	69.1

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	C	B	E	E	E	E	E	E	E	E	E	E	A	350 80
40	C	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	400 80
25	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	450 80
20	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	500 80
15	A	A	A	A	A	E	E	E	E	E	E	E	E	E	E	A	600 80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 61015		CONSIGNEE	:	
ANS RATING : CLASS 600		ENGINEERED BY	:	
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : B		CONTR.JOB NO.	:	
REV. DATE : 12/98		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 61015, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	018.1	028.1	038.1	058.1	071.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1
PIPE NIPPLE 50MM		76.30.54	031.1	041.1	051.1	071.1												
* FLANGES																		
BLIND FLANGE		76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
SPECTACLE BLIND FLANGE		76.88.37	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
WELDING NECK FLANGE		76.62.79	752.1	754.1	756.1	758.1	760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.11.14	053.1	054.1	055.1	057.1												
CHECK VALVE FLANGED		77.10.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE BUTT-WELD ENDS		77.21.14	053.1	054.1	055.1	057.1												
GATE VALVE FLANGED		77.20.04	103.1	104.1	104.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED		77.30.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	272.1	274.1	276.1	278.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1

BROB					RECB					REEB					TERB					BROB					RECB					REEB					TERB					BNIF					BNIP																													
76.					76.					76.					76.					76.					76.					76.					76.					76.80.37					76.80.31																													
RUN* BR																														BRANCH					RUN-PIPE																																							
20* 15					30.66.137.1					30.67.137.1					30.88.035.1					400* 50					79.01.374.1																									15					40-150					201.1					001.1									
25* 15					30.66.147.1					30.67.147.1					30.88.045.1					400* 80					79.01.398.1																									200-600					202.1					002.1														
25* 20					30.66.157.1					30.67.157.1					30.88.055.1					400*100					79.01.420.1																									20					40- 80					203.1					003.1									
40* 15					30.66.167.1					30.67.167.1					30.88.065.1					400*150					79.01.440.1					29.47.740.1					29.62.740.1					30.88.464.1										100-600					204.1					004.1														
40* 20					30.66.177.1					30.67.177.1					30.88.075.1					400*200					79.01.458.1					30.66.455.1					30.67.455.1					30.88.481.1										25					40- 40					205.1					005.1									
40* 25					30.66.187.1					30.67.187.1					30.88.085.1					400*250					79.01.474.1					30.66.464.1					30.67.464.1					30.88.507.1										50- 50					206.1					006.1														
50* 20					30.66.194.1					30.67.194.1					30.88.097.1					400*300					79.01.488.1					30.66.475.1					30.67.475.1					30.88.533.1										80-100					207.1					007.1														
50* 25					30.66.197.1					30.67.197.1					30.88.106.1					400*350					79.01.500.1					30.66.489.1					30.67.489.1					30.88.558.1										150-600					208.1					008.1														
50* 40					30.66.207.1					30.67.207.1					30.88.115.1					450* 50					79.01.376.1																									40					50- 50					210.1					009.1									
80* 40					30.66.227.1					30.67.227.1					30.88.124.1					450* 80					79.01.400.1																														80- 80					211.1					010.1									
80* 50					79.01.360.1					30.66.237.1					30.67.237.1					30.88.133.1					450*100					79.01.422.1																									100-100					212.1					011.1									
100* 40										30.66.251.1					30.67.251.1					30.88.142.1					450*150					79.01.442.1																									150-300					213.1					013.1									
100* 50					79.01.362.1					30.66.267.1					30.67.267.1					30.88.154.1					450*200					79.01.460.1					30.66.505.1					30.67.505.1					30.88.582.1										350-600					214.1					014.1									
100* 80					79.01.386.1					30.66.277.1					30.67.277.1					30.88.166.1					450*250					79.01.476.1					30.66.526.1					30.67.526.1					30.88.606.1																													
150* 50					79.01.364.1															450*300					79.01.490.1					30.66.556.1					30.67.556.1					30.88.630.1																																		
150* 80					79.01.388.1					30.66.297.1					30.67.297.1					30.88.178.1					450*350					79.01.502.1					30.66.587.1					30.67.587.1					30.88.654.1																													
150*100					79.01.410.1					30.66.307.1					30.67.307.1					30.88.190.1					450*400					79.01.512.1					30.66.617.1					30.67.617.1					30.88.678.1																													
200* 50					79.01.366.1															500* 50					79.01.378.1																																																	
200* 80					79.01.390.1															500* 80					79.01.402.1																																																	
200*100					79.01.412.1					30.66.327.1					30.67.327.1					30.88.206.1					500*100					79.01.424.1																																												
200*150					79.01.432.1					30.66.337.1					30.67.337.1					30.88.226.1					500*150					79.01.444.1																																												
250* 50					79.01.368.1															500*200					79.01.462.1					29.47.904.1					29.62.904.1					30.88.702.1										LEVEL					DISPLACER					CHAMBER					THERMOW									
250* 80					79.01.392.1															500*250					79.01.478.1					30.66.636.1					30.67.636.1					30.88.726.1										LENGTH					MESCNUMBER					LENGTH														
250*100					79.01.414.1					30.66.345.1					30.67.345.1					30.88.254.1					500*300					79.01.492.1					30.66.646.1					30.67.646.1					30.88.750.1										-----					-----					-----									
250*150					79.01.434.1					30.66.358.1					30.67.358.1					30.88.272.1					500*350					79.01.504.1					30.66.677.1					30.67.677.1					30.88.774.1					356					76.80.60.442.1					230														
250*200					79.01.452.1					30.66.368.1					30.67.368.1					30.88.293.1					500*400					79.01.514.1					30.66.707.1					30.67.707.1					30.88.798.1					813					76.80.60.444.1					255														
300* 50					79.01.370.1															500*450					79.01.522.1					30.66.737.1					30.67.737.1					30.88.822.1					1219					76.80.60.446.1					305																			
300* 80					79.01.394.1															600* 50					79.01.382.1																				1524					76.80.60.448.1					355																			
300*100					79.01.416.1															600* 80					79.01.406.1																				1829					76.80.60.450.1					405																			
300*150					79.01.436.1					30.66.385.1					30.67.385.1					30.88.311.1					600*100					79.01.428.1															2134					76.80.60.452.1					455																			
300*200					79.01.454.1					30.66.398.1					30.67.398.1					30.88.330.1					600*150					79.01.448.1															2438					76.80.60.454.1																								
300*250					79.01.470.1					30.66.408.1					30.67.408.1					30.88.352.1					600*200					79.01.466.1															2743					76.80.60.456.1																								
350* 50					79.01.372.1															600*250					79.01.482.1					30.66.805.1					30.67.805.1					30.88.846.1					3048					76.80.60.458.1																								
350* 80					79.01.396.1															600*300					79.01.496.1					30.66.825.1					30.67.825.1					30.88.870.1																																		
350*100					79.01.418.1															600*350					79.01.508.1					30.66.845.1					30.67.845.1					30.88.894.1																																		
350*150					79.01.438.1					30.66.415.1					30.67.415.1					30.88.374.1					600*400					79.01.518.1					30.66.887.1					30.67.887.1					30.88.918.1																													
350*200					79.01.456.1					30.66.424.1					30.67.424.1					30.88.392.1					600*450					79.01.526.1					30.66.917.1					30.67.917.1					30.88.942.1																													
350*250					79.01.472.1					30.66.439.1					30.67.439.1					30.88.417.1					600*500					79.01.532.1					30.66.947.1					30.67.947.1					30.88.966.1																													
350*300					79.01.486.1					30.66.449.1					30.67.449.1					30.88.443.1																																																						

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.60.442.1	230	76.83.37.101.1
813	76.80.60.444.1	255	76.83.37.102.1
1219	76.80.60.446.1	305	76.83.37.103.1
1524	76.80.60.448.1	355	76.83.37.105.1
1829	76.80.60.450.1	405	76.83.37.106.1
2134	76.80.60.452.1	455	76.83.37.107.1
2438	76.80.60.454.1		
2743	76.80.60.456.1		
3048	76.80.60.458.1		

COMP.	DESCRIPTION
NAME	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 80	15	4	1/2	* 80
20	4	5/8	* 90	20	4	5/8	* 90
25	4	5/8	* 90	25	4	5/8	* 90
40	4	3/4	* 110	40	4	3/4	* 110
50	8	5/8	* 110				
80	8	3/4	* 130				
100	8	7/8	* 150				
150	12	1	* 170				
200	12	1 1/8	* 190				
250	16	1 1/4	* 220				
300	20	1 1/4	* 220				
350	20	1 3/8	* 240				
400	20	1 1/2	* 250				
450	20	1 5/8	* 280				
500	24	1 5/8	* 290				
600	24	1 7/8	* 330				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 90
				20	4	5/8	* 100
				25	4	5/8	* 100
				40	4	3/4	* 120
50	8	5/8	* 150	50	8	5/8	* 120
80	8	3/4	* 150	80	8	3/4	* 150
100	8	7/8	* 160	100	8	7/8	* 170
150	12	1	* 180	150	12	1	* 210
200	12	1 1/8	* 210	200	12	1 1/8	* 230
250	16	1 1/4	* 230	250	16	1 1/4	* 260
300	20	1 1/4	* 240	300	20	1 1/4	* 270
350	20	1 3/8	* 260	350	20	1 3/8	* 290
400	20	1 1/2	* 280	400	20	1 1/2	* 310
450	20	1 5/8	* 300	450	20	1 5/8	* 340
500	24	1 5/8	* 320	500	24	1 5/8	* 360
600	24	1 7/8	* 360	600	24	1 7/8	* 420

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.053.1	
PIPE NIPPLE 50MM	1	76.30.54.031.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* DRAIN POINT	DN 15	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.053.1	
PIPE NIPPLE 50MM	1	76.30.54.031.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.054.1	
STUD BOLT WITH NUTS	4	81.38.66.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	2	77.21.14.053.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	2	76.62.79.752.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.053.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
PIPE NIPPLE 50MM	1	76.30.54.031.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.053.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.04.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.66.157.1	
	8	81.38.66.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.66.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.66.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.053.1	
PIPE NIPPLE 50MM	1	76.30.54.031.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.054.1	
PIPE NIPPLE 50MM	1	76.30.54.041.1	
STUD BOLT WITH NUTS	4	81.38.66.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.054.1	
STUD BOLT WITH NUTS	4	81.38.66.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

CLASS 61031

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400
		PRESSURE BAR GA								
DN15	-600	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	67.9

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 160
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 160
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	B	A												350 80
40	C	B	B	A													400 80
25	B	B	A														450 80
20	B	A															500 80
15	A																600 80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 61031	CONSIGNEE	:	
ANS RATING : CLASS 600	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 61031, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
		DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,STELLITE 6
		DN 50-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	020.1	030.1	040.1	060.1	073.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1
PIPE NIPPLE 50MM		76.30.57	436.1	446.1	456.1	476.1												
* FLANGES																		
BLIND FLANGE		76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
SPECTACLE BLIND FLANGE		76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
WELDING NECK FLANGE		76.62.79	802.1	804.1	806.1	808.1	810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	062.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1	264.1	284.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	103.1	104.1	105.1	107.1												
		77.10.20					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.20.04	103.1	104.1	105.1	107.1												
		77.20.20					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE FLANGED		77.30.05	103.1	104.1	105.1	107.1												
		77.30.20					108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	272.1	274.1	276.1	278.1												
ORIFICE FLANGE SET		76.62.95					810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.02.194.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.398.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.420.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1	450* 50	79.02.196.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.400.1			
80* 50	79.02.180.1	30.72.238.1	30.73.238.1	30.89.138.1	450*100	79.01.422.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.442.1			
100* 50	79.02.182.1	30.72.253.1	30.73.253.1	30.89.147.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.02.184.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.02.186.1				500* 50	79.02.198.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.01.444.1			
250* 50	79.02.188.1				500*200	79.01.462.1	29.46.904.1	29.61.904.1	30.89.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.72.636.1	30.73.636.1	30.89.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.01.492.1	30.72.646.1	30.73.646.1	30.89.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.01.504.1	30.72.677.1	30.73.677.1	30.89.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.01.514.1	30.72.707.1	30.73.707.1	30.89.798.1
300* 50	79.02.190.1				500*450	79.01.522.1	30.72.737.1	30.73.737.1	30.89.822.1
300* 80	79.01.394.1				600* 50	79.02.200.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.01.466.1			
350* 50	79.02.192.1				600*250	79.01.482.1	30.72.805.1	30.73.805.1	30.89.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.72.825.1	30.73.825.1	30.89.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.72.845.1	30.73.845.1	30.89.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.01.518.1	30.72.887.1	30.73.887.1	30.89.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.01.526.1	30.72.917.1	30.73.917.1	30.89.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.01.532.1	30.72.947.1	30.73.947.1	30.89.966.1
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-600	221.1	016.1
20	40-600	223.1	018.1
25	40-100	225.1	020.1
	150-600	226.1	024.1
40	50-100	230.1	026.1
	150-600	231.1	028.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNBER	LENGTH	MESCNBER
-----	-----	-----	-----
450	76.81.65.072.1	450	76.81.65.572.1
840	76.81.65.074.1	840	76.81.65.574.1
1230	76.81.65.076.1	1230	76.81.65.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNBER	LENGTH	MESCNBER
-----	-----	-----	-----
356	76.80.60.082.1	230	76.83.37.101.1
813	76.80.60.084.1	255	76.83.37.102.1
1219	76.80.60.086.1	305	76.83.37.103.1
1524	76.80.60.088.1	355	76.83.37.105.1
1829	76.80.60.090.1	405	76.83.37.106.1
2134	76.80.60.092.1	455	76.83.37.107.1
2438	76.80.60.094.1		
2743	76.80.60.096.1		
3048	76.80.60.098.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	80	61.157.1	15	4	1/2	*	80	61.157.1
20	4	5/8	*	90	61.271.1	20	4	5/8	*	90	61.271.1
25	4	5/8	*	90	61.271.1	25	4	5/8	*	90	61.271.1
40	4	3/4	*	110	61.330.1	40	4	3/4	*	110	61.330.1
50	8	5/8	*	110	61.274.1						
80	8	3/4	*	130	61.334.1						
100	8	7/8	*	150	61.406.1						
150	12	1	*	170	61.474.1						
200	12	1 1/8	*	190	61.535.1						
250	16	1 1/4	*	220	61.597.1						
300	20	1 1/4	*	220	61.597.1						
350	20	1 3/8	*	240	61.646.1						
400	20	1 1/2	*	250	61.688.1						
450	20	1 5/8	*	280	61.722.1						
500	24	1 5/8	*	290	61.724.1						
600	24	1 7/8	*	330	61.786.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	90	61.159.1	
					20	4	5/8	*	100	61.273.1	
					25	4	5/8	*	100	61.273.1	
					40	4	3/4	*	120	61.332.1	
50	8	5/8	*	150	61.281.1	50	8	5/8	*	120	61.276.1
80	8	3/4	*	150	61.337.1	80	8	3/4	*	150	61.337.1
100	8	7/8	*	160	61.407.1	100	8	7/8	*	170	61.409.1
150	12	1	*	180	61.475.1	150	12	1	*	210	61.480.1
200	12	1 1/8	*	210	61.538.1	200	12	1 1/8	*	230	61.541.1
250	16	1 1/4	*	230	61.598.1	250	16	1 1/4	*	260	61.603.1
300	20	1 1/4	*	240	61.600.1	300	20	1 1/4	*	270	61.605.1
350	20	1 3/8	*	260	61.649.1	350	20	1 3/8	*	290	61.654.1
400	20	1 1/2	*	280	61.693.1	400	20	1 1/2	*	310	61.698.1
450	20	1 5/8	*	300	61.725.1	450	20	1 5/8	*	340	61.732.1
500	24	1 5/8	*	320	61.728.1	500	24	1 5/8	*	360	61.736.1
600	24	1 7/8	*	360	61.791.1	600	24	1 7/8	*	420	61.802.1

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.10.208.1	
GASKET, SPIRAL WOUND		2	85.41.46.104.1	
GATE VALVE FLANGED		1	77.20.04.103.1	
STUD BOLT WITH NUTS		8	81.38.61.157.1	
WELDING NECK FLANGE		1	76.62.79.802.1	

* DRAIN POINT		DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.10.212.1	
GASKET, SPIRAL WOUND		2	85.41.46.106.1	
GATE VALVE FLANGED		1	77.20.04.104.1	
STUD BOLT WITH NUTS		8	81.38.61.271.1	
WELDING NECK FLANGE		1	76.62.79.804.1	

* DRAIN POINT		DN 20	FIG.OH	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.10.212.1	
GASKET, SPIRAL WOUND		2	85.41.46.106.1	
GATE VALVE FLANGED		1	77.20.04.104.1	
STUD BOLT WITH NUTS		8	81.38.61.271.1	

* PRESSURE INSTR.CONN.		DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
GASKET, SPIRAL WOUND		2	85.41.46.104.1	
GATE VALVE FLANGED		1	77.20.04.103.1	
LAP-JOINT FLANGE		1	76.62.20.308.1	
STUD BOLT WITH NUTS		4	81.38.61.157.1	
		4	81.38.61.157.1	
WELDING NECK FLANGE		1	76.62.79.802.1	

* PRESSURE INSTR.CONN.		DN 15	FIG.OH	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
GASKET, SPIRAL WOUND		2	85.41.46.104.1	
GATE VALVE FLANGED		1	77.20.04.103.1	
LAP-JOINT FLANGE		1	76.62.20.308.1	
STUD BOLT WITH NUTS		4	81.38.61.157.1	
		4	81.38.61.157.1	

* METERRUN INSTR. CONN		DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
GASKET, SPIRAL WOUND		4	85.41.46.104.1	
GATE VALVE FLANGED		2	77.20.04.103.1	
LAP-JOINT FLANGE		2	76.62.20.308.1	
STUD BOLT WITH NUTS		8	81.38.61.157.1	
		8	81.38.61.157.1	

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.535.1	
GASKET, SPIRAL WOUND		1	85.41.46.112.1	
STUD BOLT WITH NUTS		4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM		1	76.83.37.101.1	

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE		1	76.62.60.535.1	
GASKET, SPIRAL WOUND		1	85.41.46.112.1	
STUD BOLT WITH NUTS		4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM		1	76.83.37.102.1	

* VENT POINT		DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.10.208.1	
GASKET, SPIRAL WOUND		2	85.41.46.104.1	
GLOBE VALVE FLANGED		1	77.30.05.103.1	
STUD BOLT WITH NUTS		8	81.38.61.157.1	
WELDING NECK FLANGE		1	76.62.79.802.1	

* VENT POINT		DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.10.212.1	
GASKET, SPIRAL WOUND		2	85.41.46.106.1	
GLOBE VALVE FLANGED		1	77.30.05.104.1	
STUD BOLT WITH NUTS		8	81.38.61.271.1	
WELDING NECK FLANGE		1	76.62.79.804.1	

* VENT POINT		DN 20	FIG.1H	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)		1	(PIPING COMP.)	
BLIND FLANGE		1	76.62.10.212.1	
GASKET, SPIRAL WOUND		2	85.41.46.106.1	
GLOBE VALVE FLANGED		1	77.30.05.104.1	
STUD BOLT WITH NUTS		8	81.38.61.271.1	

CLASS 61041

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	69.1

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	C	B	A											350 80
40	C	B	B	A													400 80
25	B	B	A														450 80
20	B	A															500 80
15	A																600 80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 61041	CONSIGNEE	:	
ANS RATING : CLASS 600	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 61041, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE			40	50	80	100	150	200	250	300	350	400	450	500	600
			15	20	25													

* PIPE																		
PIPE		74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
SPECTACLE BLIND FLANGE		76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
WELDING NECK FLANGE		76.62.79	752.1	754.1	756.1	758.1	760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1	264.1	284.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.20.04	103.1	104.1	104.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE FLANGED		77.30.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	272.1	274.1	276.1	278.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.01.374.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.01.398.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.01.420.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1	450* 50	79.01.376.1			
80* 40		30.72.227.1	30.73.227.1	30.89.124.1	450* 80	79.01.400.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.422.1			
100* 40		30.72.251.1	30.73.251.1		450*150	79.01.442.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.01.364.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.01.366.1				500* 50	79.01.378.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.01.444.1			
250* 50	79.01.368.1				500*200	79.01.462.1	29.46.904.1	29.61.904.1	30.89.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.72.636.1	30.73.636.1	30.89.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.01.492.1	30.72.646.1	30.73.646.1	30.89.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.01.504.1	30.72.677.1	30.73.677.1	30.89.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.01.514.1	30.72.707.1	30.73.707.1	30.89.798.1
300* 50	79.01.370.1				500*450	79.01.522.1	30.72.737.1	30.73.737.1	30.89.822.1
300* 80	79.01.394.1				600* 50	79.01.382.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.01.466.1			
350* 50	79.01.372.1				600*250	79.01.482.1	30.72.805.1	30.73.805.1	30.89.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.72.825.1	30.73.825.1	30.89.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.72.845.1	30.73.845.1	30.89.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.01.518.1	30.72.887.1	30.73.887.1	30.89.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.01.526.1	30.72.917.1	30.73.917.1	30.89.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.01.532.1	30.72.947.1	30.73.947.1	30.89.966.1
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	201.1	001.1
	200-600	202.1	002.1
20	40- 80	203.1	003.1
	100-600	204.1	004.1
25	40- 40	205.1	005.1
	50- 50	206.1	006.1
	80-100	207.1	007.1
	150-600	208.1	008.1
40	50- 50	210.1	009.1
	80- 80	211.1	010.1
	100-100	212.1	011.1
	150-300	213.1	013.1
	350-600	214.1	014.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.072.1	450	76.81.65.572.1
840	76.81.65.074.1	840	76.81.65.574.1
1230	76.81.65.076.1	1230	76.81.65.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.082.1	230	76.83.37.101.1
813	76.80.60.084.1	255	76.83.37.102.1
1219	76.80.60.086.1	305	76.83.37.103.1
1524	76.80.60.088.1	355	76.83.37.105.1
1829	76.80.60.090.1	405	76.83.37.106.1
2134	76.80.60.092.1	455	76.83.37.107.1
2438	76.80.60.094.1		
2743	76.80.60.096.1		
3048	76.80.60.098.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	80	61.157.1	15	4	1/2	*	80	61.157.1
20	4	5/8	*	90	61.271.1	20	4	5/8	*	90	61.271.1
25	4	5/8	*	90	61.271.1	25	4	5/8	*	90	61.271.1
40	4	3/4	*	110	61.330.1	40	4	3/4	*	110	61.330.1
50	8	5/8	*	110	61.274.1						
80	8	3/4	*	130	61.334.1						
100	8	7/8	*	150	61.406.1						
150	12	1	*	170	61.474.1						
200	12	1 1/8	*	190	61.535.1						
250	16	1 1/4	*	220	61.597.1						
300	20	1 1/4	*	220	61.597.1						
350	20	1 3/8	*	240	61.646.1						
400	20	1 1/2	*	250	61.688.1						
450	20	1 5/8	*	280	61.722.1						
500	24	1 5/8	*	290	61.724.1						
600	24	1 7/8	*	330	61.786.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
						15	4	1/2	*	90	61.159.1
						20	4	5/8	*	100	61.273.1
						25	4	5/8	*	100	61.273.1
						40	4	3/4	*	120	61.332.1
50	8	5/8	*	150	61.281.1	50	8	5/8	*	120	61.276.1
80	8	3/4	*	150	61.337.1	80	8	3/4	*	150	61.337.1
100	8	7/8	*	160	61.407.1	100	8	7/8	*	170	61.409.1
150	12	1	*	180	61.475.1	150	12	1	*	210	61.480.1
200	12	1 1/8	*	210	61.538.1	200	12	1 1/8	*	230	61.541.1
250	16	1 1/4	*	230	61.598.1	250	16	1 1/4	*	260	61.603.1
300	20	1 1/4	*	240	61.600.1	300	20	1 1/4	*	270	61.605.1
350	20	1 3/8	*	260	61.649.1	350	20	1 3/8	*	290	61.654.1
400	20	1 1/2	*	280	61.693.1	400	20	1 1/2	*	310	61.698.1
450	20	1 5/8	*	300	61.725.1	450	20	1 5/8	*	340	61.732.1
500	24	1 5/8	*	320	61.728.1	500	24	1 5/8	*	360	61.736.1
600	24	1 7/8	*	360	61.791.1	600	24	1 7/8	*	420	61.802.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.04.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.04.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.04.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.04.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	
WELDING NECK FLANGE	2	76.62.79.752.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.04.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.04.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.04.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.30.05.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.752.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.05.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.754.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.05.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

CLASS 61042

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	67.9

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL
(AMBIENT TO FLUID) 265 DEG. C.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	160
300	C	C	C	C	E	E	E	E	E	E	E	A					80	80
250	C	C	C	C	E	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	E	A							150	80
150	C	C	C	C	E	E	E	E	A								200	80
100	C	C	C	C	E	E	E	A									250	80
80	C	C	C	C	E	A											300	80
50	C	C	C	B	A												350	80
40	C	B	B	A													400	80
25	B	B	A														450	80
20	B	A															500	80
15	A																600	80

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 61042	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 61042, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE			40	50	80	100	150	200	250	300	350	400	450	500	600
			15	20	25													

* PIPE																		
PIPE		74.30.05	020.1	030.1	040.1	060.1	073.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1
PIPE NIPPLE 50MM		76.30.57	436.1	446.1	456.1	476.1												
* FLANGES																		
BLIND FLANGE		76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
SPECTACLE BLIND FLANGE		76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
WELDING NECK FLANGE		76.62.79	802.1	804.1	806.1	808.1	810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	062.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1	264.1	284.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
* VALVES																		
CHECK VALVE FLANGED		77.10.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.20.04	103.1	104.1	104.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE FLANGED		77.30.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	272.1	274.1	276.1	278.1												
ORIFICE FLANGE SET		76.62.95					810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.02.194.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.398.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.420.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1	450* 50	79.02.196.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.400.1			
80* 50	79.02.180.1	30.72.238.1	30.73.238.1	30.89.138.1	450*100	79.01.422.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.442.1			
100* 50	79.02.182.1	30.72.253.1	30.73.253.1	30.89.147.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.02.184.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.02.186.1				500* 50	79.02.198.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.01.444.1			
250* 50	79.02.188.1				500*200	79.01.462.1	29.46.904.1	29.61.904.1	30.89.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.72.636.1	30.73.636.1	30.89.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.01.492.1	30.72.646.1	30.73.646.1	30.89.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.01.504.1	30.72.677.1	30.73.677.1	30.89.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.01.514.1	30.72.707.1	30.73.707.1	30.89.798.1
300* 50	79.02.190.1				500*450	79.01.522.1	30.72.737.1	30.73.737.1	30.89.822.1
300* 80	79.01.394.1				600* 50	79.02.200.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.01.466.1			
350* 50	79.02.192.1				600*250	79.01.482.1	30.72.805.1	30.73.805.1	30.89.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.72.825.1	30.73.825.1	30.89.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.72.845.1	30.73.845.1	30.89.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.01.518.1	30.72.887.1	30.73.887.1	30.89.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.01.526.1	30.72.917.1	30.73.917.1	30.89.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.01.532.1	30.72.947.1	30.73.947.1	30.89.966.1
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-600	221.1	016.1
20	40-600	223.1	018.1
25	40-100	225.1	020.1
	150-600	226.1	024.1
40	50-100	230.1	026.1
	150-600	231.1	028.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.65.072.1	450	76.81.65.572.1
840	76.81.65.074.1	840	76.81.65.574.1
1230	76.81.65.076.1	1230	76.81.65.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.082.1	230	76.83.37.101.1
813	76.80.60.084.1	255	76.83.37.102.1
1219	76.80.60.086.1	305	76.83.37.103.1
1524	76.80.60.088.1	355	76.83.37.105.1
1829	76.80.60.090.1	405	76.83.37.106.1
2134	76.80.60.092.1	455	76.83.37.107.1
2438	76.80.60.094.1		
2743	76.80.60.096.1		
3048	76.80.60.098.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	80	61.157.1	15	4	1/2	*	80	61.157.1
20	4	5/8	*	90	61.271.1	20	4	5/8	*	90	61.271.1
25	4	5/8	*	90	61.271.1	25	4	5/8	*	90	61.271.1
40	4	3/4	*	110	61.330.1	40	4	3/4	*	110	61.330.1
50	8	5/8	*	110	61.274.1						
80	8	3/4	*	130	61.334.1						
100	8	7/8	*	150	61.406.1						
150	12	1	*	170	61.474.1						
200	12	1 1/8	*	190	61.535.1						
250	16	1 1/4	*	220	61.597.1						
300	20	1 1/4	*	220	61.597.1						
350	20	1 3/8	*	240	61.646.1						
400	20	1 1/2	*	250	61.688.1						
450	20	1 5/8	*	280	61.722.1						
500	24	1 5/8	*	290	61.724.1						
600	24	1 7/8	*	330	61.786.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	90	61.159.1	
					20	4	5/8	*	100	61.273.1	
					25	4	5/8	*	100	61.273.1	
					40	4	3/4	*	120	61.332.1	
50	8	5/8	*	150	61.281.1	50	8	5/8	*	120	61.276.1
80	8	3/4	*	150	61.337.1	80	8	3/4	*	150	61.337.1
100	8	7/8	*	160	61.407.1	100	8	7/8	*	170	61.409.1
150	12	1	*	180	61.475.1	150	12	1	*	210	61.480.1
200	12	1 1/8	*	210	61.538.1	200	12	1 1/8	*	230	61.541.1
250	16	1 1/4	*	230	61.598.1	250	16	1 1/4	*	260	61.603.1
300	20	1 1/4	*	240	61.600.1	300	20	1 1/4	*	270	61.605.1
350	20	1 3/8	*	260	61.649.1	350	20	1 3/8	*	290	61.654.1
400	20	1 1/2	*	280	61.693.1	400	20	1 1/2	*	310	61.698.1
450	20	1 5/8	*	300	61.725.1	450	20	1 5/8	*	340	61.732.1
500	24	1 5/8	*	320	61.728.1	500	24	1 5/8	*	360	61.736.1
600	24	1 7/8	*	360	61.791.1	600	24	1 7/8	*	420	61.802.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.04.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.04.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.804.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.04.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.04.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	
WELDING NECK FLANGE	2	76.62.79.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.04.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.04.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.04.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.30.05.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.05.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.804.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.05.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

CLASS 61055

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
		0	50	100	150	200	250	300	350	400

		PRESSURE BAR GA								
DN15 -600		99.1	97.1	92.7	90.6	87.8	83.6	77.5	73.9	67.9

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY
ALLOWABLE STRESS OF BOLTING MATERIAL
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	160
300	C	C	C	C	E	E	E	E	E	E	E	E					80	80
250	C	C	C	C	E	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	E	A							150	80
150	C	C	C	C	E	E	E	E	A								200	80
100	C	C	C	C	E	E	E	A									250	80
80	C	C	C	C	E	A											300	80
50	C	C	C	C	B	A											350	80
40	C	B	B	A													400	80
25	B	B	A														450	80
20	B	A															500	80
15	A																600	80

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 61055		CONSIGNEE	:	
ANS RATING : CLASS 600		ENGINEERED BY	:	
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : B		CONTR.JOB NO.	:	
REV. DATE : 12/98		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.03	020.1	030.1	040.1	060.1	073.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1
PIPE NIPPLE	50MM	76.30.54	036.1	046.1	056.1	076.1												
* FLANGES																		
BLIND FLANGE		76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
SPECTACLE BLIND FLANGE		76.88.37	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
WELDING NECK FLANGE		76.62.79	802.1	804.1	806.1	808.1	810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.17	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.11.14	233.1	234.1	235.1	237.1												
CHECK VALVE FLANGED		77.10.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE BUTT-WELD ENDS		77.21.14	103.1	104.1	105.1	107.1												
GATE VALVE FLANGED		77.20.04	103.1	104.1	104.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	103.1	104.1	105.1	107.1												
GLOBE VALVE FLANGED		77.30.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	272.1	274.1	276.1	278.1												
ORIFICE FLANGE SET		76.62.95					810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.02.194.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.01.398.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.01.420.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.01.440.1	29.47.740.1	29.62.740.1	30.88.464.1
40* 20		30.66.181.1	30.67.181.1		400*200	79.01.458.1	30.66.455.1	30.67.455.1	30.88.481.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250	79.01.474.1	30.66.464.1	30.67.464.1	30.88.507.1
50* 20		30.66.195.1	30.67.195.1		400*300	79.01.488.1	30.66.475.1	30.67.475.1	30.88.533.1
50* 25		30.66.201.1	30.67.201.1		400*350	79.01.500.1	30.66.489.1	30.67.489.1	30.88.558.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1	450* 50	79.02.196.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450* 80	79.01.400.1			
80* 50	79.02.180.1	30.66.238.1	30.67.238.1	30.88.138.1	450*100	79.01.422.1			
100* 40		30.66.253.1	30.67.253.1	30.88.147.1	450*150	79.01.442.1			
100* 50	79.02.182.1	30.66.268.1	30.67.268.1	30.88.159.1	450*200	79.01.460.1	30.66.505.1	30.67.505.1	30.88.582.1
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1	450*250	79.01.476.1	30.66.526.1	30.67.526.1	30.88.606.1
150* 50	79.02.184.1				450*300	79.01.490.1	30.66.556.1	30.67.556.1	30.88.630.1
150* 80	79.01.388.1	30.66.297.1	30.67.297.1	30.88.178.1	450*350	79.01.502.1	30.66.587.1	30.67.587.1	30.88.654.1
150*100	79.01.410.1	30.66.307.1	30.67.307.1	30.88.190.1	450*400	79.01.512.1	30.66.617.1	30.67.617.1	30.88.678.1
200* 50	79.02.186.1				500* 50	79.02.198.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.66.327.1	30.67.327.1	30.88.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.66.337.1	30.67.337.1	30.88.226.1	500*150	79.01.444.1			
250* 50	79.02.188.1				500*200	79.01.462.1	29.47.904.1	29.62.904.1	30.88.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.66.636.1	30.67.636.1	30.88.726.1
250*100	79.01.414.1	30.66.345.1	30.67.345.1	30.88.254.1	500*300	79.01.492.1	30.66.646.1	30.67.646.1	30.88.750.1
250*150	79.01.434.1	30.66.358.1	30.67.358.1	30.88.272.1	500*350	79.01.504.1	30.66.677.1	30.67.677.1	30.88.774.1
250*200	79.01.452.1	30.66.368.1	30.67.368.1	30.88.293.1	500*400	79.01.514.1	30.66.707.1	30.67.707.1	30.88.798.1
300* 50	79.02.190.1				500*450	79.01.522.1	30.66.737.1	30.67.737.1	30.88.822.1
300* 80	79.01.394.1				600* 50	79.02.200.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.66.385.1	30.67.385.1	30.88.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.66.398.1	30.67.398.1	30.88.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.66.408.1	30.67.408.1	30.88.352.1	600*200	79.01.466.1			
350* 50	79.02.192.1				600*250	79.01.482.1	30.66.805.1	30.67.805.1	30.88.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.66.825.1	30.67.825.1	30.88.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.66.845.1	30.67.845.1	30.88.894.1
350*150	79.01.438.1	30.66.415.1	30.67.415.1	30.88.374.1	600*400	79.01.518.1	30.66.887.1	30.67.887.1	30.88.918.1
350*200	79.01.456.1	30.66.424.1	30.67.424.1	30.88.392.1	600*450	79.01.526.1	30.66.917.1	30.67.917.1	30.88.942.1
350*250	79.01.472.1	30.66.439.1	30.67.439.1	30.88.417.1	600*500	79.01.532.1	30.66.947.1	30.67.947.1	30.88.966.1
350*300	79.01.486.1	30.66.449.1	30.67.449.1	30.88.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-600	221.1	016.1
20	40-600	223.1	018.1
25	40-100	225.1	020.1
	150-600	226.1	024.1
40	50-100	230.1	026.1
	150-600	231.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.442.1			230 76.83.37.101.1
813	76.80.60.444.1			255 76.83.37.102.1
1219	76.80.60.446.1			305 76.83.37.103.1
1524	76.80.60.448.1			355 76.83.37.105.1
1829	76.80.60.450.1			405 76.83.37.106.1
2134	76.80.60.452.1			455 76.83.37.107.1
2438	76.80.60.454.1			
2743	76.80.60.456.1			
3048	76.80.60.458.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	1/2	* 80	15	4	1/2	* 80
20	4	5/8	* 90	20	4	5/8	* 90
25	4	5/8	* 90	25	4	5/8	* 90
40	4	3/4	* 110	40	4	3/4	* 110
50	8	5/8	* 110				
80	8	3/4	* 130				
100	8	7/8	* 150				
150	12	1	* 170				
200	12	1 1/8	* 190				
250	16	1 1/4	* 220				
300	20	1 1/4	* 220				
350	20	1 3/8	* 240				
400	20	1 1/2	* 250				
450	20	1 5/8	* 280				
500	24	1 5/8	* 290				
600	24	1 7/8	* 330				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	1/2	* 90
				20	4	5/8	* 100
				25	4	5/8	* 100
				40	4	3/4	* 120
50	8	5/8	* 150	50	8	5/8	* 120
80	8	3/4	* 150	80	8	3/4	* 150
100	8	7/8	* 160	100	8	7/8	* 170
150	12	1	* 180	150	12	1	* 210
200	12	1 1/8	* 210	200	12	1 1/8	* 230
250	16	1 1/4	* 230	250	16	1 1/4	* 260
300	20	1 1/4	* 240	300	20	1 1/4	* 270
350	20	1 3/8	* 260	350	20	1 3/8	* 290
400	20	1 1/2	* 280	400	20	1 1/2	* 310
450	20	1 5/8	* 300	450	20	1 5/8	* 340
500	24	1 5/8	* 320	500	24	1 5/8	* 360
600	24	1 7/8	* 360	600	24	1 7/8	* 420

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1	
PIPE NIPPLE 50MM	1	76.30.54.036.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.104.1	
PIPE NIPPLE 50MM	1	76.30.54.046.1	
STUD BOLT WITH NUTS	4	81.38.66.271.1	
WELDING NECK FLANGE	1	76.62.79.804.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.104.1	
STUD BOLT WITH NUTS	4	81.38.66.271.1	
WELDING NECK FLANGE	1	76.62.79.804.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	2	77.21.14.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	2	76.62.79.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
PIPE NIPPLE 50MM	1	76.30.54.036.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.04.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.66.157.1	
	8	81.38.66.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.66.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.66.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.103.1	
PIPE NIPPLE 50MM	1	76.30.54.036.1	
STUD BOLT WITH NUTS	4	81.38.66.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.104.1	
PIPE NIPPLE 50MM	1	76.30.54.046.1	
STUD BOLT WITH NUTS	4	81.38.66.271.1	
WELDING NECK FLANGE	1	76.62.79.804.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.104.1	
STUD BOLT WITH NUTS	4	81.38.66.271.1	
WELDING NECK FLANGE	1	76.62.79.804.1	

CLASS 61071

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400

		PRESSURE BAR GA								
DN15	-400	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	69.1

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	C	B	E	E	E	E	E	E	E	E	E	E	A	350 80
40	C	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	400 80
25	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	450 80
20	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	500 80
15	A	A	A	A	A	E	E	E	E	E	E	E	E	E	E	A	600 80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 61071	CONSIGNEE	:	
ANS RATING : CLASS 600	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 61071, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

61071, REV.B PAGE 3

		NOMINAL PIPE SIZE																
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600	
ITEM	DESCRIPTION	MESC																

* PIPE																		
PIPE		74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1
PIPE NIPPLE	50MM	76.30.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
SPECTACLE BLIND FLANGE		76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
WELDING NECK FLANGE		76.62.79	752.1	754.1	756.1	758.1	760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1	264.1	284.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.11.26	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE BUTT-WELD ENDS		77.21.26	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.20.26	103.1	104.1	105.1	107.1	108.1											
GLOBE VALVE BUTT-WELD ENDS		77.31.26	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	272.1	274.1	276.1	278.1												
ORIFICE FLANGE SET		76.62.95					760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.01.374.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.01.398.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.01.420.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1	450* 50	79.01.376.1			
80* 40		30.72.227.1	30.73.227.1	30.89.124.1	450* 80	79.01.400.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.422.1			
100* 40		30.72.251.1	30.73.251.1		450*150	79.01.442.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.01.364.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.01.366.1				500* 50	79.01.378.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.01.444.1			
250* 50	79.01.368.1				500*200	79.01.462.1	29.46.904.1	29.61.904.1	30.89.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.72.636.1	30.73.636.1	30.89.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.01.492.1	30.72.646.1	30.73.646.1	30.89.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.01.504.1	30.72.677.1	30.73.677.1	30.89.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.01.514.1	30.72.707.1	30.73.707.1	30.89.798.1
300* 50	79.01.370.1				500*450	79.01.522.1	30.72.737.1	30.73.737.1	30.89.822.1
300* 80	79.01.394.1				600* 50	79.01.382.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.01.466.1			
350* 50	79.01.372.1				600*250	79.01.482.1	30.72.805.1	30.73.805.1	30.89.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.72.825.1	30.73.825.1	30.89.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.72.845.1	30.73.845.1	30.89.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.01.518.1	30.72.887.1	30.73.887.1	30.89.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.01.526.1	30.72.917.1	30.73.917.1	30.89.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.01.532.1	30.72.947.1	30.73.947.1	30.89.966.1
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	201.1	001.1
	200-600	202.1	002.1
20	40- 80	203.1	003.1
	100-600	204.1	004.1
25	40- 40	205.1	005.1
	50- 50	206.1	006.1
	80-100	207.1	007.1
	150-600	208.1	008.1
40	50- 50	210.1	009.1
	80- 80	211.1	010.1
	100-100	212.1	011.1
	150-300	213.1	013.1
	350-600	214.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.082.1		230	76.83.37.101.1
813	76.80.60.084.1		255	76.83.37.102.1
1219	76.80.60.086.1		305	76.83.37.103.1
1524	76.80.60.088.1		355	76.83.37.105.1
1829	76.80.60.090.1		405	76.83.37.106.1
2134	76.80.60.092.1		455	76.83.37.107.1
2438	76.80.60.094.1			
2743	76.80.60.096.1			
3048	76.80.60.098.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	80	15	4	1/2	*	80
20	4	5/8	*	90	20	4	5/8	*	90
25	4	5/8	*	90	25	4	5/8	*	90
40	4	3/4	*	110	40	4	3/4	*	110
50	8	5/8	*	110					
80	8	3/4	*	130					
100	8	7/8	*	150					
150	12	1	*	170					
200	12	1 1/8	*	190					
250	16	1 1/4	*	220					
300	20	1 1/4	*	220					
350	20	1 3/8	*	240					
400	20	1 1/2	*	250					
450	20	1 5/8	*	280					
500	24	1 5/8	*	290					
600	24	1 7/8	*	330					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230
250	16	1 1/4	*	230	250	16	1 1/4	*	260
300	20	1 1/4	*	240	300	20	1 1/4	*	270
350	20	1 3/8	*	260	350	20	1 3/8	*	290
400	20	1 1/2	*	280	400	20	1 1/2	*	310
450	20	1 5/8	*	300	450	20	1 5/8	*	340
500	24	1 5/8	*	320	500	24	1 5/8	*	360
600	24	1 7/8	*	360	600	24	1 7/8	*	420

ASSEMBLIES

* DRAIN POINT		DN 15	FIG.0M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.208.1		
GASKET, SPIRAL WOUND	1	85.41.46.104.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.26.103.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	1	76.62.79.752.1		

* DRAIN POINT		DN 20	FIG.0M	DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.212.1		
GASKET, SPIRAL WOUND	1	85.41.46.106.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.26.104.1		
STUD BOLT WITH NUTS	4	81.38.61.271.1		
WELDING NECK FLANGE	1	76.62.79.754.1		

* ORIFICE INSTR.CONN.		DN 15	FIG.0M	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	2	85.41.46.104.1		
GATE VALVE BUTT-WELD ENDS	2	77.21.26.103.1		
LAP-JOINT FLANGE	2	76.62.20.308.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	2	76.62.79.752.1		

* PRESSURE INSTR.CONN.		DN 15	FIG.0M	DN 15 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	1	85.41.46.104.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.26.103.1		
LAP-JOINT FLANGE	1	76.62.20.308.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	1	76.62.79.752.1		

* METERRUN INSTR. CONN		DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	4	85.41.46.104.1		
GATE VALVE FLANGED	2	77.20.26.103.1		
LAP-JOINT FLANGE	2	76.62.20.308.1		
STUD BOLT WITH NUTS	8	81.38.61.157.1		
	8	81.38.61.157.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1		
GASKET, SPIRAL WOUND	1	85.41.46.112.1		
STUD BOLT WITH NUTS	4	81.38.61.334.1		
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1		

* TEMPERATURE INSTR.C.		DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1		
GASKET, SPIRAL WOUND	1	85.41.46.112.1		
STUD BOLT WITH NUTS	4	81.38.61.334.1		
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1		

* VENT POINT		DN 15	FIG.1M	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.208.1		
GASKET, SPIRAL WOUND	1	85.41.46.104.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.26.103.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	1	76.62.79.752.1		

* VENT POINT		DN 20	FIG.1M	DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.212.1		
GASKET, SPIRAL WOUND	1	85.41.46.106.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.26.104.1		
STUD BOLT WITH NUTS	4	81.38.61.271.1		
WELDING NECK FLANGE	1	76.62.79.754.1		

CLASS 61076

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -600	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	67.9

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCHSIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	160
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E		80	80
250	C	C	C	C	E	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	E	A							150	80
150	C	C	C	C	E	E	E	E	A								200	80
100	C	C	C	C	E	E	E	A									250	80
80	C	C	C	C	E	A											300	80
50	C	C	C	B	A												350	80
40	C	B	B	A													400	80
25	B	B	A														450	80
20	B	A															500	80
15	A																600	80

CODE EXPLANATION OF CHARACTERS

A EQUAL TEE
B REDUCING TEE
C BRANCH FITTING
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 61076	CONSIGNEE	:	
ANS RATING : CLASS 600	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 61076, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

61076, REV.B PAGE 3

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.30.05	020.1	030.1	040.1	060.1	073.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1
PIPE NIPPLE	50MM	76.30.57	436.1	446.1	456.1	476.1												
* FLANGES																		
BLIND FLANGE		76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1
SPECTACLE BLIND FLANGE		76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1
WELDING NECK FLANGE		76.62.79	802.1	804.1	806.1	808.1	810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1
* FITTINGS																		
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	062.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1	264.1	284.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.11.26	303.1	304.1	305.1	307.1	308.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE BUTT-WELD ENDS		77.21.26	303.1	304.1	305.1	307.1	308.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.20.26	103.1	104.1	105.1	107.1	108.1											
GLOBE VALVE BUTT-WELD ENDS		77.31.26	303.1	304.1	305.1	307.1	308.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	272.1	274.1	276.1	278.1												
ORIFICE FLANGE SET		76.62.95					810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.02.194.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.398.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.420.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1	450* 50	79.02.196.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.400.1			
80* 50	79.02.180.1	30.72.238.1	30.73.238.1	30.89.138.1	450*100	79.01.422.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.442.1			
100* 50	79.02.182.1	30.72.268.1	30.73.268.1	30.89.159.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.02.184.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.02.186.1				500* 50	79.02.198.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.01.444.1			
250* 50	79.02.188.1				500*200	79.01.462.1	29.46.904.1	29.61.904.1	30.89.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.72.636.1	30.73.636.1	30.89.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.01.492.1	30.72.646.1	30.73.646.1	30.89.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.01.504.1	30.72.677.1	30.73.677.1	30.89.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.01.514.1	30.72.707.1	30.73.707.1	30.89.798.1
300* 50	79.02.190.1				500*450	79.01.522.1	30.72.737.1	30.73.737.1	30.89.822.1
300* 80	79.01.394.1				600* 50	79.02.200.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.01.466.1			
350* 50	79.02.192.1				600*250	79.01.482.1	30.72.805.1	30.73.805.1	30.89.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.72.825.1	30.73.825.1	30.89.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.72.845.1	30.73.845.1	30.89.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.01.518.1	30.72.887.1	30.73.887.1	30.89.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.01.526.1	30.72.917.1	30.73.917.1	30.89.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.01.532.1	30.72.947.1	30.73.947.1	30.89.966.1
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	221.1	016.1
20	40-600	223.1	018.1
25	40-100	225.1	020.1
	150-600	226.1	024.1
40	50-100	230.1	026.1
	150-600	231.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.082.1			230 76.83.37.101.1
813	76.80.60.084.1			255 76.83.37.102.1
1219	76.80.60.086.1			305 76.83.37.103.1
1524	76.80.60.088.1			355 76.83.37.105.1
1829	76.80.60.090.1			405 76.83.37.106.1
2134	76.80.60.092.1			455 76.83.37.107.1
2438	76.80.60.094.1			
2743	76.80.60.096.1			
3048	76.80.60.098.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	80	15	4	1/2	*	80
20	4	5/8	*	90	20	4	5/8	*	90
25	4	5/8	*	90	25	4	5/8	*	90
40	4	3/4	*	110	40	4	3/4	*	110
50	8	5/8	*	110					
80	8	3/4	*	130					
100	8	7/8	*	150					
150	12	1	*	170					
200	12	1 1/8	*	190					
250	16	1 1/4	*	220					
300	20	1 1/4	*	220					
350	20	1 3/8	*	240					
400	20	1 1/2	*	250					
450	20	1 5/8	*	280					
500	24	1 5/8	*	290					
600	24	1 7/8	*	330					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230
250	16	1 1/4	*	230	250	16	1 1/4	*	260
300	20	1 1/4	*	240	300	20	1 1/4	*	270
350	20	1 3/8	*	260	350	20	1 3/8	*	290
400	20	1 1/2	*	280	400	20	1 1/2	*	310
450	20	1 5/8	*	300	450	20	1 5/8	*	340
500	24	1 5/8	*	320	500	24	1 5/8	*	360
600	24	1 7/8	*	360	600	24	1 7/8	*	420

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.208.1		
GASKET, SPIRAL WOUND	1	85.41.46.104.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.26.303.1		
PIPE NIPPLE 50MM	1	76.30.57.436.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	1	76.62.79.802.1		

* DRAIN POINT DN 20 FIG.0N DN 40 - 40				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.212.1		
GASKET, SPIRAL WOUND	1	85.41.46.106.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.26.304.1		
PIPE NIPPLE 50MM	1	76.30.57.446.1		
STUD BOLT WITH NUTS	4	81.38.61.271.1		
WELDING NECK FLANGE	1	76.62.79.804.1		

* DRAIN POINT DN 20 FIG.0M DN 50 -600				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.212.1		
GASKET, SPIRAL WOUND	1	85.41.46.106.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.26.304.1		
STUD BOLT WITH NUTS	4	81.38.61.271.1		
WELDING NECK FLANGE	1	76.62.79.804.1		

* ORIFICE INSTR.CONN. DN 15 FIG.0M DN 50 -600				
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	2	85.41.46.104.1		
GATE VALVE BUTT-WELD ENDS	2	77.21.26.303.1		
LAP-JOINT FLANGE	2	76.62.20.308.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	2	76.62.79.802.1		

* PRESSURE INSTR.CONN. DN 15 FIG.0N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	1	85.41.46.104.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.26.303.1		
LAP-JOINT FLANGE	1	76.62.20.308.1		
PIPE NIPPLE 50MM	1	76.30.57.436.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	1	76.62.79.802.1		

* PRESSURE INSTR.CONN. DN 15 FIG.0M DN 40 -600				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	1	85.41.46.104.1		
GATE VALVE BUTT-WELD ENDS	1	77.21.26.303.1		
LAP-JOINT FLANGE	1	76.62.20.308.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	1	76.62.79.802.1		

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40				
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	4	85.41.46.104.1		
GATE VALVE FLANGED	2	77.20.26.103.1		
LAP-JOINT FLANGE	2	76.62.20.308.1		
STUD BOLT WITH NUTS	8	81.38.61.157.1		
	8	81.38.61.157.1		

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1		
GASKET, SPIRAL WOUND	1	85.41.46.112.1		
STUD BOLT WITH NUTS	4	81.38.61.334.1		
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1		

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -600				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1		
GASKET, SPIRAL WOUND	1	85.41.46.112.1		
STUD BOLT WITH NUTS	4	81.38.61.334.1		
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1		

* VENT POINT DN 15 FIG.1N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.208.1		
GASKET, SPIRAL WOUND	1	85.41.46.104.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.26.303.1		
PIPE NIPPLE 50MM	1	76.30.57.436.1		
STUD BOLT WITH NUTS	4	81.38.61.157.1		
WELDING NECK FLANGE	1	76.62.79.802.1		

* VENT POINT DN 20 FIG.1N DN 40 - 40				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.212.1		
GASKET, SPIRAL WOUND	1	85.41.46.106.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.26.304.1		
PIPE NIPPLE 50MM	1	76.30.57.446.1		
STUD BOLT WITH NUTS	4	81.38.61.271.1		
WELDING NECK FLANGE	1	76.62.79.804.1		

* VENT POINT DN 20 FIG.1M DN 50 -600				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.62.10.212.1		
GASKET, SPIRAL WOUND	1	85.41.46.106.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.31.26.304.1		
STUD BOLT WITH NUTS	4	81.38.61.271.1		
WELDING NECK FLANGE	1	76.62.79.804.1		

CLASS 61172

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	-50	0	50	100	150	200	250	300	340	
PRESSURE BAR GA										
DN15 -400	95.8	95.8	94.7	90.3	87.8	85.3	81.1	75.3	72.2	

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
350	C	C	C	C	E	E	E	E	E	E	E	E	A		
300	C	C	C	C	E	E	E	E	E	E	E	A			
250	C	C	C	C	E	E	E	E	E	E	A				
200	C	C	C	C	E	E	E	E	A						
150	C	C	C	C	E	E	E	A							
100	C	C	C	C	E	E	A								
80	C	C	C	C	E	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	40
80	40
100	40
150	80
200	80
250	80
300	80
350	80
400	80

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	PLANT :	
CLASS NO. : 61172	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316 (L) ,GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE															
PIPE		74.30.17	021.1	029.1	037.1	053.1	059.1	067.1	075.1	086.1	098.1	110.1	122.1	135.1	144.1
PIPE NIPPLE 50MM		76.31.57	531.1	541.1	551.1	571.1									
* FLANGES															
BLIND FLANGE		76.62.12	558.1	562.1	566.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	582.1	584.1	586.1
SPECTACLE BLIND FLANGE		76.88.34	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1
SPACER RING TYPE (ASME FLANGE)		76.88.17	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
WELDING NECK FLANGE		76.62.86	152.1	154.1	156.1	158.1	076.1	078.1	080.1	166.1	168.1	170.1	172.1	174.1	176.1
* FITTINGS															
CAP BUTT-WELD.END		76.31.18	168.1	174.1	180.1	188.1	208.1	228.1	246.1	268.1	288.1	310.1	332.1	352.1	372.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38	168.1	174.1	180.1	188.1	208.1	228.1	246.1	268.1	288.1	310.1	332.1	352.1	372.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	168.1	174.1	180.1	188.1	208.1	228.1	246.1	268.1	288.1	310.1	332.1	352.1	372.1
EQUAL TEE BUTT-WELD ENDS		76.31.84	168.1	174.1	180.1	188.1	208.1	228.1	246.1	268.1	288.1	310.1	332.1	352.1	372.1
* VALVES															
CHECK VALVE FLANGED		77.10.33	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1
GATE VALVE FLANGED		77.20.33	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1
GLOBE VALVE FLANGED		77.30.33	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1					
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1
METER RUN		76.65.96	322.1	324.1	326.1	328.1									
ORIFICE FLANGE SET		76.62.97					710.1	712.1	714.1	766.1	768.1	770.1	772.1	774.1	776.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		31.70.137.1	31.71.137.1	31.85.035.1	400* 50	79.04.721.1			
25* 15		31.70.147.1	31.71.147.1	31.85.045.1	400* 80	79.04.733.1			
25* 20		31.70.157.1	31.71.157.1	31.85.055.1	400*100	79.04.744.1			
40* 15		31.70.167.1	31.71.167.1	31.85.065.1	400*150	79.05.440.1	29.44.740.1	29.59.740.1	31.85.464.1
40* 20		31.70.177.1	31.71.177.1	31.85.075.1	400*200	79.05.458.1	31.70.455.1	31.71.455.1	31.85.481.1
40* 25		31.70.187.1	31.71.187.1	31.85.085.1	400*250	79.05.474.1	31.70.464.1	31.71.464.1	31.85.507.1
50* 20		29.44.192.1	29.59.192.1	31.85.100.1	400*300	79.05.488.1	31.70.475.1	31.71.475.1	31.85.533.1
50* 25		31.70.198.1	31.71.198.1	31.85.109.1	400*350	79.05.500.1	31.70.489.1	31.71.489.1	31.85.558.1
50* 40		31.70.206.1	31.71.206.1	31.85.118.1					
80* 40		31.70.226.1	31.71.226.1	31.85.127.1					
80* 50	79.04.810.1	31.70.235.1	31.71.235.1	31.85.132.1					
100* 40		31.70.250.1	31.71.250.1	31.85.145.1					
100* 50	79.04.812.1	31.70.265.1	31.71.265.1	31.85.153.1					
100* 80	79.04.836.1	31.70.275.1	31.71.275.1	31.85.165.1					
150* 50	79.04.716.1								
150* 80	79.04.728.1	31.70.298.1	31.71.298.1	31.85.182.1					
150*100	79.04.739.1	31.70.308.1	31.71.308.1	31.85.195.1					
200* 50	79.04.717.1								
200* 80	79.04.729.1								
200*100	79.04.740.1	31.70.323.1	31.71.323.1	31.85.213.1					
200*150	79.05.432.1	31.70.337.1	31.71.337.1	31.85.226.1					
250* 50	79.04.718.1								
250* 80	79.04.730.1								
250*100	79.04.741.1	29.44.346.1	29.59.346.1	31.85.260.1					
250*150	79.05.434.1	31.70.358.1	31.71.358.1	31.85.272.1					
250*200	79.05.452.1	31.70.367.1	31.71.367.1	31.85.293.1					
300* 50	79.04.719.1								
300* 80	79.04.731.1								
300*100	79.04.742.1								
300*150	79.05.436.1	31.70.385.1	31.71.385.1	31.85.311.1					
300*200	79.05.454.1	31.70.397.1	31.71.397.1	31.85.330.1					
300*250	79.05.470.1	31.70.408.1	31.71.408.1	31.85.352.1					
350* 50	79.04.720.1								
350* 80	79.04.732.1								
350*100	79.04.743.1								
350*150	79.05.438.1	31.70.415.1	31.71.415.1	31.85.374.1					
350*200	79.05.456.1	31.70.424.1	31.71.424.1	31.85.392.1					
350*250	79.05.472.1	31.70.439.1	31.71.439.1	31.85.417.1					
350*300	79.05.486.1	31.70.449.1	31.71.449.1	31.85.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	701.1	101.1
	200-400	702.1	102.1
20	40- 80	703.1	103.1
	100-400	704.1	104.1
25	40- 40	705.1	105.1
	50- 50	706.1	106.1
	80-100	707.1	107.1
	150-400	708.1	108.1
40	50- 50	710.1	109.1
	80- 80	711.1	110.1
	100-100	712.1	111.1
	150-300	713.1	113.1
	350-400	714.1	114.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.282.1		230	76.83.37.101.1
813	76.80.60.284.1		255	76.83.37.102.1
1219	76.80.60.286.1		305	76.83.37.103.1
1524	76.80.60.288.1		355	76.83.37.105.1
1829	76.80.60.290.1		405	76.83.37.106.1
2134	76.80.60.292.1		455	76.83.37.107.1
2438	76.80.60.294.1			
2743	76.80.60.296.1			
3048	76.80.60.298.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	* 80	63.157.1	15	4	1/2	* 80	63.157.1
20	4	5/8	* 90	63.271.1	20	4	5/8	* 90	63.271.1
25	4	5/8	* 90	63.271.1	25	4	5/8	* 90	63.271.1
40	4	3/4	* 110	63.330.1	40	4	3/4	* 110	63.330.1
50	8	5/8	* 110	63.274.1					
80	8	3/4	* 130	63.334.1					
100	8	7/8	* 150	63.406.1					
150	12	1	* 170	63.474.1					
200	12	1 1/8	* 190	63.535.1					
250	16	1 1/4	* 220	63.597.1					
300	20	1 1/4	* 220	63.597.1					
350	20	1 3/8	* 240	63.646.1					
400	20	1 1/2	* 250	63.688.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230
250	16	1 1/4	*	230	250	16	1 1/4	*	260
300	20	1 1/4	*	240	300	20	1 1/4	*	270
350	20	1 3/8	*	260	350	20	1 3/8	*	290
400	20	1 1/2	*	280	400	20	1 1/2	*	310

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.558.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.33.103.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.157.1	
WELDING NECK FLANGE	1	76.62.86.152.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.562.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.33.104.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.271.1	
WELDING NECK FLANGE	1	76.62.86.154.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.562.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.33.104.1	
STUD BOLT WITH NUTS	8	81.38.63.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.33.103.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.63.157.1	
	8	81.38.63.157.1	
WELDING NECK FLANGE	2	76.62.86.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.33.103.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	4	81.38.63.157.1	
	4	81.38.63.157.1	
WELDING NECK FLANGE	1	76.62.86.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.33.103.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
STUD BOLT WITH NUTS	4	81.38.63.157.1	
	4	81.38.63.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.33.103.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.63.157.1	
	8	81.38.63.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.63.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.63.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.558.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.30.33.103.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.157.1	
WELDING NECK FLANGE	1	76.62.86.152.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.562.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.33.104.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.271.1	
WELDING NECK FLANGE	1	76.62.86.154.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.562.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.33.104.1	
STUD BOLT WITH NUTS	8	81.38.63.271.1	

CLASS 61173

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	-50	0	50	100	150	200	250	300	340	
PRESSURE BAR GA										
DN15 -400	95.8	95.8	94.7	90.3	87.8	85.3	81.1	75.3	72.2	

- NOTES
- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
- WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
350	C	C	C	C	E	E	E	E	E	E	E	E	A		
300	C	C	C	C	E	E	E	E	E	E	E	A			
250	C	C	C	C	E	E	E	E	E	E	A				
200	C	C	C	C	E	E	E	E	E	A					
150	C	C	C	C	E	E	E	E	A						
100	C	C	C	C	E	E	A								
80	C	C	C	C	E	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	40
80	40
100	40
150	80
200	80
250	80
300	80
350	80
400	80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR PWHT	PLANT :	
CLASS NO. : 61173	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 61173, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A350-LF2
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 61173, REV.B PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION		MESC													

* PIPE															
PIPE		74.30.17	021.1	029.1	037.1	053.1	059.1	067.1	075.1	086.1	098.1	110.1	122.1	135.1	144.1
PIPE NIPPLE 50MM		76.31.57	531.1	541.1	551.1	571.1									
* FLANGES															
BLIND FLANGE		76.62.12	558.1	562.1	566.1	568.1	570.1	572.1	574.1	576.1	578.1	580.1	582.1	584.1	586.1
SPECTACLE BLIND FLANGE		76.88.34	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1
SPACER RING TYPE (ASME FLANGE)		76.88.17	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
WELDING NECK FLANGE		76.62.86	152.1	154.1	156.1	158.1	076.1	078.1	080.1	166.1	168.1	170.1	172.1	174.1	176.1
* FITTINGS															
CAP BUTT-WELD.END		76.31.18	168.1	174.1	180.1	188.1	208.1	228.1	246.1	268.1	288.1	310.1	332.1	352.1	372.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38	168.1	174.1	180.1	188.1	208.1	228.1	246.1	268.1	288.1	310.1	332.1	352.1	372.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	168.1	174.1	180.1	188.1	208.1	228.1	246.1	268.1	288.1	310.1	332.1	352.1	372.1
EQUAL TEE BUTT-WELD ENDS		76.31.84	168.1	174.1	180.1	188.1	208.1	228.1	246.1	268.1	288.1	310.1	332.1	352.1	372.1
* VALVES															
CHECK VALVE FLANGED		77.10.38	403.1	404.1	405.1	407.1	408.1	410.1	412.1	414.1	415.1	416.1	417.1	418.1	419.1
GATE VALVE FLANGED		77.20.38	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1
GLOBE VALVE FLANGED		77.30.38	403.1	404.1	405.1	407.1	408.1	410.1	412.1	414.1					
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1
METER RUN		76.65.96	322.1	324.1	326.1	328.1									
ORIFICE FLANGE SET		76.62.96					640.1	642.1	564.1	590.1	592.1	594.1	596.1	598.1	600.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		31.70.137.1	31.71.137.1	31.85.035.1	400* 50	79.04.721.1			
25* 15		31.70.147.1	31.71.147.1	31.85.045.1	400* 80	79.04.733.1			
25* 20		31.70.157.1	31.71.157.1	31.85.055.1	400*100	79.04.744.1			
40* 15		31.70.167.1	31.71.167.1	31.85.065.1	400*150	79.05.440.1	29.44.740.1	29.59.740.1	31.85.464.1
40* 20		31.70.177.1	31.71.177.1	31.85.075.1	400*200	79.05.458.1	31.70.455.1	31.71.455.1	31.85.481.1
40* 25		31.70.187.1	31.71.187.1	31.85.085.1	400*250	79.05.474.1	31.70.464.1	31.71.464.1	31.85.507.1
50* 20		29.44.192.1	29.59.192.1	31.85.100.1	400*300	79.05.488.1	31.70.475.1	31.71.475.1	31.85.533.1
50* 25		31.70.198.1	31.71.198.1	31.85.109.1	400*350	79.05.500.1	31.70.489.1	31.71.489.1	31.85.558.1
50* 40		31.70.206.1	31.71.206.1	31.85.118.1					
80* 40		31.70.226.1	31.71.226.1	31.85.127.1					
80* 50	79.04.810.1	31.70.235.1	31.71.235.1	31.85.132.1					
100* 40		31.70.250.1	31.71.250.1	31.85.145.1					
100* 50	79.04.812.1	31.70.265.1	31.71.265.1	31.85.153.1					
100* 80	79.04.836.1	31.70.275.1	31.71.275.1	31.85.165.1					
150* 50	79.04.716.1								
150* 80	79.04.728.1	31.70.298.1	31.71.298.1	31.85.182.1					
150*100	79.04.739.1	31.70.308.1	31.71.308.1	31.85.195.1					
200* 50	79.04.717.1								
200* 80	79.04.729.1								
200*100	79.04.740.1	31.70.323.1	31.71.323.1	31.85.213.1					
200*150	79.05.432.1	31.70.337.1	31.71.337.1	31.85.226.1					
250* 50	79.04.718.1								
250* 80	79.04.730.1								
250*100	79.04.741.1	29.44.346.1	29.59.346.1	31.85.260.1					
250*150	79.05.434.1	31.70.358.1	31.71.358.1	31.85.272.1					
250*200	79.05.452.1	31.70.367.1	31.71.367.1	31.85.293.1					
300* 50	79.04.719.1								
300* 80	79.04.731.1								
300*100	79.04.742.1								
300*150	79.05.436.1	31.70.385.1	31.71.385.1	31.85.311.1					
300*200	79.05.454.1	31.70.397.1	31.71.397.1	31.85.330.1					
300*250	79.05.470.1	31.70.408.1	31.71.408.1	31.85.352.1					
350* 50	79.04.720.1								
350* 80	79.04.732.1								
350*100	79.04.743.1								
350*150	79.05.438.1	31.70.415.1	31.71.415.1	31.85.374.1					
350*200	79.05.456.1	31.70.424.1	31.71.424.1	31.85.392.1					
350*250	79.05.472.1	31.70.439.1	31.71.439.1	31.85.417.1					
350*300	79.05.486.1	31.70.449.1	31.71.449.1	31.85.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	701.1	101.1
	200-400	702.1	102.1
20	40- 80	703.1	103.1
	100-400	704.1	104.1
25	40- 40	705.1	105.1
	50- 50	706.1	106.1
	80-100	707.1	107.1
	150-400	708.1	108.1
40	50- 50	710.1	109.1
	80- 80	711.1	110.1
	100-100	712.1	111.1
	150-300	713.1	113.1
	350-400	714.1	114.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.59.282.1		230	76.83.37.101.1
813	76.80.59.284.1		255	76.83.37.102.1
1219	76.80.59.286.1		305	76.83.37.103.1
1524	76.80.59.288.1		355	76.83.37.105.1
1829	76.80.59.290.1		405	76.83.37.106.1
2134	76.80.59.292.1		455	76.83.37.107.1
2438	76.80.59.294.1			
2743	76.80.59.296.1			
3048	76.80.59.298.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	* 80	63.157.1	15	4	1/2	* 80	63.157.1
20	4	5/8	* 90	63.271.1	20	4	5/8	* 90	63.271.1
25	4	5/8	* 90	63.271.1	25	4	5/8	* 90	63.271.1
40	4	3/4	* 110	63.330.1	40	4	3/4	* 110	63.330.1
50	8	5/8	* 110	63.274.1					
80	8	3/4	* 130	63.334.1					
100	8	7/8	* 150	63.406.1					
150	12	1	* 170	63.474.1					
200	12	1 1/8	* 190	63.535.1					
250	16	1 1/4	* 220	63.597.1					
300	20	1 1/4	* 220	63.597.1					
350	20	1 3/8	* 240	63.646.1					
400	20	1 1/2	* 250	63.688.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	90	63.159.1	
					20	4	5/8	*	100	63.273.1	
					25	4	5/8	*	100	63.273.1	
					40	4	3/4	*	120	63.332.1	
50	8	5/8	*	150	63.281.1	50	8	5/8	*	120	63.276.1
80	8	3/4	*	150	63.337.1	80	8	3/4	*	150	63.337.1
100	8	7/8	*	160	63.407.1	100	8	7/8	*	170	63.409.1
150	12	1	*	180	63.475.1	150	12	1	*	210	63.480.1
200	12	1 1/8	*	210	63.538.1	200	12	1 1/8	*	230	63.541.1
250	16	1 1/4	*	230	63.598.1	250	16	1 1/4	*	260	63.603.1
300	20	1 1/4	*	240	63.600.1	300	20	1 1/4	*	270	63.605.1
350	20	1 3/8	*	260	63.649.1	350	20	1 3/8	*	290	63.654.1
400	20	1 1/2	*	280	63.693.1	400	20	1 1/2	*	310	63.698.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.558.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.38.103.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.157.1	
WELDING NECK FLANGE	1	76.62.86.152.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.562.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.38.104.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.271.1	
WELDING NECK FLANGE	1	76.62.86.154.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.562.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.38.104.1	
STUD BOLT WITH NUTS	8	81.38.63.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.38.103.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.63.157.1	
	8	81.38.63.157.1	
WELDING NECK FLANGE	2	76.62.86.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.38.103.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	4	81.38.63.157.1	
	4	81.38.63.157.1	
WELDING NECK FLANGE	1	76.62.86.152.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.38.103.1	
LAP-JOINT FLANGE	1	76.62.20.808.1	
STUD BOLT WITH NUTS	4	81.38.63.157.1	
	4	81.38.63.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.38.103.1	
LAP-JOINT FLANGE	2	76.62.20.808.1	
STUD BOLT WITH NUTS	8	81.38.63.157.1	
	8	81.38.63.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.63.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.63.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.558.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.30.38.403.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.157.1	
WELDING NECK FLANGE	1	76.62.86.152.1	

* VENT POINT	DN 20	FIG.1H	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.562.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.38.404.1	
STUD BOLT WITH NUTS	8	81.38.63.271.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.562.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.38.404.1	
STUD BOLT WITH NUTS	8	81.38.63.271.1	

CLASS 61261

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	

	PRESSURE BAR GA									
DN15 -400	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	69.1	

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - STEAM TRAPS TO BE SELECTED BY UTILITY ENGINEER.
 - API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
350	C	C	C	C	E	E	E	E	E	E	E	E	A		
300	C	C	C	C	E	E	E	E	E	E	E	A			
250	C	C	C	C	E	E	E	E	E	E	A				
200	C	C	C	C	E	E	E	E	A						
150	C	C	C	C	E	E	E	A							
100	C	C	C	C	E	E	A								
80	C	C	C	C	E	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	80
150	80
200	80
250	80
300	80
350	80
400	80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 61261	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 61261, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-350	API 5L-B (SML)
AWEF	PIPE (API 5L-B, EW)	DN150-200	API 5L-B (WLD)
AWSA	PIPE (API 5L-B, SAW)	DN400-400	API 5L-B (WLD)
PIPE	PIPE	DN 15-400	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVS	CHECK VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GABS	GATE VALVE SW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVS	GATE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLBS	GLOBE VALVE SW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 50-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVS	GLOBE VALVE SOCKET WELD	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE												
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE														
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	071.1	109.1	157.1			295.1	341.1	391.1	
PIPE (API 5L-B, EW)	74.13.14								219.1	255.1				
PIPE (API 5L-B, SAW)	74.13.17													445.1
PIPE	74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1									
* FLANGES														
BLIND FLANGE	76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1
SPECTACLE BLIND FLANGE	76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1
WELDING NECK FLANGE	76.62.79	752.1	754.1	756.1	758.1	760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1
* FITTINGS														
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1
* VALVES														
CHECK VALVE BUTT-WELD ENDS	77.11.14					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1
CHECK VALVE SOCKET WELD	77.11.04	003.1	004.1	005.1	007.1									
GATE VALVE SW BELLOWS SEALED	77.21.05	053.1	054.1	055.1	057.1									
GATE VALVE BUTT-WELD ENDS	77.21.14					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1
GATE VALVE FLANGED	77.20.04	103.1	104.1	104.1	107.1	108.1								
GATE VALVE SOCKET WELD	77.21.04	003.1	004.1	005.1	007.1									
GLOBE VALVE SW BELLOWS SEALED	77.31.03	053.1	054.1	055.1	057.1									
GLOBE VALVE BUTT-WELD ENDS	77.31.14					108.1	110.1	112.1	114.1					
GLOBE VALVE SOCKET WELD	77.31.04	003.1	004.1	005.1	007.1									
* MISCELLANEOUS														
GASKET, SPIRAL WOUND	85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1
METER RUN	76.65.96	272.1	274.1	276.1	278.1									
ORIFICE FLANGE SET	76.62.95					760.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.01.374.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.01.398.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.01.420.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1					
80* 40		30.72.227.1	30.73.227.1	30.89.124.1					
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1					
100* 40		30.72.251.1	30.73.251.1						
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1					
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1					
150* 50	79.01.364.1								
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1					
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1					
200* 50	79.01.366.1								
200* 80	79.01.390.1								
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1					
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1					
250* 50	79.01.368.1								
250* 80	79.01.392.1								
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1					
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1					
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1					
300* 50	79.01.370.1								
300* 80	79.01.394.1								
300*100	79.01.416.1								
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1					
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1					
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1					
350* 50	79.01.372.1								
350* 80	79.01.396.1								
350*100	79.01.418.1								
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1					
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1					
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1					
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	201.1	001.1
	200-400	202.1	002.1
20	40- 80	203.1	003.1
	100-400	204.1	004.1
25	40- 40	205.1	005.1
	50- 50	206.1	006.1
	80-100	207.1	007.1
	150-400	208.1	008.1
40	50- 50	210.1	009.1
	80- 80	211.1	010.1
	100-100	212.1	011.1
	150-300	213.1	013.1
	350-400	214.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.082.1		230	76.83.37.101.1
813	76.80.60.084.1		255	76.83.37.102.1
1219	76.80.60.086.1		305	76.83.37.103.1
1524	76.80.60.088.1		355	76.83.37.105.1
1829	76.80.60.090.1		405	76.83.37.106.1
2134	76.80.60.092.1		455	76.83.37.107.1
2438	76.80.60.094.1			
2743	76.80.60.096.1			
3048	76.80.60.098.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	80	61.157.1	15	4	1/2	*	80	61.157.1
20	4	5/8	*	90	61.271.1	20	4	5/8	*	90	61.271.1
25	4	5/8	*	90	61.271.1	25	4	5/8	*	90	61.271.1
40	4	3/4	*	110	61.330.1	40	4	3/4	*	110	61.330.1
50	8	5/8	*	110	61.274.1						
80	8	3/4	*	130	61.334.1						
100	8	7/8	*	150	61.406.1						
150	12	1	*	170	61.474.1						
200	12	1 1/8	*	190	61.535.1						
250	16	1 1/4	*	220	61.597.1						
300	20	1 1/4	*	220	61.597.1						
350	20	1 3/8	*	240	61.646.1						
400	20	1 1/2	*	250	61.688.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	90	61.159.1	
					20	4	5/8	*	100	61.273.1	
					25	4	5/8	*	100	61.273.1	
					40	4	3/4	*	120	61.332.1	
50	8	5/8	*	150	61.281.1	50	8	5/8	*	120	61.276.1
80	8	3/4	*	150	61.337.1	80	8	3/4	*	150	61.337.1
100	8	7/8	*	160	61.407.1	100	8	7/8	*	170	61.409.1
150	12	1	*	180	61.475.1	150	12	1	*	210	61.480.1
200	12	1 1/8	*	210	61.538.1	200	12	1 1/8	*	230	61.541.1
250	16	1 1/4	*	230	61.598.1	250	16	1 1/4	*	260	61.603.1
300	20	1 1/4	*	240	61.600.1	300	20	1 1/4	*	270	61.605.1
350	20	1 3/8	*	260	61.649.1	350	20	1 3/8	*	290	61.654.1
400	20	1 1/2	*	280	61.693.1	400	20	1 1/2	*	310	61.698.1

ASSEMBLIES

* DRAIN POINT					DN 15	FIG.0E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
BLIND FLANGE					1	76.62.10.208.1	
GASKET, SPIRAL WOUND					1	85.41.46.104.1	
GATE VALVE SOCKET WELD					1	77.21.04.003.1	
PIPE NIPPLE 50MM					2	76.30.57.431.1	
STUD BOLT WITH NUTS					4	81.38.61.157.1	
WELDING NECK FLANGE					1	76.62.79.752.1	

* DRAIN POINT					DN 20	FIG.0E	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
BLIND FLANGE					1	76.62.10.212.1	
GASKET, SPIRAL WOUND					1	85.41.46.106.1	
GATE VALVE SOCKET WELD					1	77.21.04.004.1	
PIPE NIPPLE 50MM					2	76.30.57.441.1	
STUD BOLT WITH NUTS					4	81.38.61.271.1	
WELDING NECK FLANGE					1	76.62.79.754.1	

* DRAIN POINT					DN 20	FIG.0D	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
BLIND FLANGE					1	76.62.10.212.1	
GASKET, SPIRAL WOUND					1	85.41.46.106.1	
GATE VALVE SOCKET WELD					1	77.21.04.004.1	
PIPE NIPPLE 50MM					1	76.30.57.441.1	
STUD BOLT WITH NUTS					4	81.38.61.271.1	
WELDING NECK FLANGE					1	76.62.79.754.1	

* ORIFICE INSTR.CONN.					DN 15	FIG.0D	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
GASKET, SPIRAL WOUND					2	85.41.46.104.1	
GATE VALVE SOCKET WELD					2	77.21.04.003.1	
LAP-JOINT FLANGE					2	76.62.20.308.1	
PIPE NIPPLE 50MM					2	76.30.57.431.1	
STUD BOLT WITH NUTS					8	81.38.61.157.1	
WELDING NECK FLANGE					2	76.62.79.752.1	

* PRESSURE INSTR.CONN.					DN 15	FIG.0E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
GASKET, SPIRAL WOUND					1	85.41.46.104.1	
GATE VALVE SOCKET WELD					1	77.21.04.003.1	
LAP-JOINT FLANGE					1	76.62.20.308.1	
PIPE NIPPLE 50MM					2	76.30.57.431.1	
STUD BOLT WITH NUTS					4	81.38.61.157.1	
WELDING NECK FLANGE					1	76.62.79.752.1	

* PRESSURE INSTR.CONN.					DN 15	FIG.0D	DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
GASKET, SPIRAL WOUND					1	85.41.46.104.1	
GATE VALVE SOCKET WELD					1	77.21.04.003.1	
LAP-JOINT FLANGE					1	76.62.20.308.1	
PIPE NIPPLE 50MM					1	76.30.57.431.1	
STUD BOLT WITH NUTS					4	81.38.61.157.1	
WELDING NECK FLANGE					1	76.62.79.752.1	

* METERRUN INSTR. CONN					DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
GASKET, SPIRAL WOUND					4	85.41.46.104.1	
GATE VALVE FLANGED					2	77.20.04.103.1	
LAP-JOINT FLANGE					2	76.62.20.308.1	
STUD BOLT WITH NUTS					8	81.38.61.157.1	
					8	81.38.61.157.1	

* TEMPERATURE INSTR.C.					DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE					1	76.62.60.535.1	
GASKET, SPIRAL WOUND					1	85.41.46.112.1	
STUD BOLT WITH NUTS					4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM					1	76.83.37.101.1	

* TEMPERATURE INSTR.C.					DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE					1	76.62.60.535.1	
GASKET, SPIRAL WOUND					1	85.41.46.112.1	
STUD BOLT WITH NUTS					4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM					1	76.83.37.102.1	

* VENT POINT					DN 15	FIG.1E	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
BLIND FLANGE					1	76.62.10.208.1	
GASKET, SPIRAL WOUND					1	85.41.46.104.1	
GLOBE VALVE SOCKET WELD					1	77.31.04.003.1	
PIPE NIPPLE 50MM					2	76.30.57.431.1	
STUD BOLT WITH NUTS					4	81.38.61.157.1	
WELDING NECK FLANGE					1	76.62.79.752.1	

* VENT POINT					DN 20	FIG.1D	DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
BLIND FLANGE					1	76.62.10.212.1	
GASKET, SPIRAL WOUND					1	85.41.46.106.1	
GLOBE VALVE SOCKET WELD					1	77.31.04.004.1	
PIPE NIPPLE 50MM					1	76.30.57.441.1	
STUD BOLT WITH NUTS					4	81.38.61.271.1	
WELDING NECK FLANGE					1	76.62.79.754.1	

* VENT POINT					DN 20	FIG.1D	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1	(PIPING COMP.)	
BLIND FLANGE					1	76.62.10.212.1	
GASKET, SPIRAL WOUND					1	85.41.46.106.1	
GLOBE VALVE SOCKET WELD					1	77.31.04.004.1	
PIPE NIPPLE 50MM					1	76.30.57.441.1	
STUD BOLT WITH NUTS					4	81.38.61.271.1	
WELDING NECK FLANGE					1	76.62.79.754.1	

CLASS 61371

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400

		PRESSURE BAR GA								
DN15	-600	102.0	100.0	92.7	90.6	87.8	83.6	77.5	73.9	67.9

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - WELDS, ATTACHMENT WELDS AND COLD FORMED PIPING PARTS SHALL BE POST-WELD HEAT TREATED, SEE DEP 30.10.60.18-GEN. AND DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	160
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	160
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	160
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	160
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	160
300	C	C	C	C	E	E	E	E	E	E	E						80	80
250	C	C	C	C	E	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	E	A							150	80
150	C	C	C	C	E	E	E	A									200	80
100	C	C	C	C	E	E	A										250	80
80	C	C	C	C	E	E	A										300	80
50	C	C	C	B	A												350	80
40	C	B	B	A													400	80
25	B	B	A														450	80
20	B	A															500	80
15	A																600	80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PWHT	PLANT	:	
CLASS NO. : 61371		CONSIGNEE	:	
ANS RATING : CLASS 600		ENGINEERED BY :		
CORR. ALL. : 3 mm.		PRINCIPAL :		
REV. LETTER : C		CONTR.JOB NO. :		
REV. DATE : 12/98		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 61371, REV.C PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

61371, REV.C PAGE 3

		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE	74.30.05	020.1	030.1	040.1	060.1	073.1	109.1	157.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1	548.1	597.1	
* FLANGES																		
BLIND FLANGE	76.62.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	242.1	
SPECTACLE BLIND FLANGE	76.88.03	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	104.1	106.1	108.1	110.1	112.1	
WELDING NECK FLANGE	76.62.79	802.1	804.1	806.1	808.1	810.1	762.1	764.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	784.1	
* FITTINGS																		
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	062.1	078.1	098.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1	264.1	284.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	612.1	628.1	648.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1	814.1	834.1	
* VALVES																		
CHECK VALVE FLANGED	77.10.12	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1	
GATE VALVE FLANGED	77.20.36	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1	
GLOBE VALVE FLANGED	77.30.12	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1									
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND	85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1	
METER RUN	76.65.96	272.1	274.1	276.1	278.1													
ORIFICE FLANGE SET	76.62.96																	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.02.194.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.01.398.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.01.420.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.01.440.1	29.46.740.1	29.61.740.1	30.89.464.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.01.458.1	30.72.455.1	30.73.455.1	30.89.481.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.01.474.1	30.72.464.1	30.73.464.1	30.89.507.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1	450* 50	79.02.196.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.400.1			
80* 50	79.02.180.1	30.72.238.1	30.73.238.1	30.89.138.1	450*100	79.01.422.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.442.1			
100* 50	79.02.182.1	30.72.268.1	30.73.268.1	30.89.159.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.02.184.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.02.186.1				500* 50	79.02.198.1			
200* 80	79.01.390.1				500* 80	79.01.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.01.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.01.444.1			
250* 50	79.02.188.1				500*200	79.01.462.1	29.46.904.1	29.61.904.1	30.89.702.1
250* 80	79.01.392.1				500*250	79.01.478.1	30.72.636.1	30.73.636.1	30.89.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.01.492.1	30.72.646.1	30.73.646.1	30.89.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.01.504.1	30.72.677.1	30.73.677.1	30.89.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.01.514.1	30.72.707.1	30.73.707.1	30.89.798.1
300* 50	79.02.190.1				500*450	79.01.522.1	30.72.737.1	30.73.737.1	30.89.822.1
300* 80	79.01.394.1				600* 50	79.02.200.1			
300*100	79.01.416.1				600* 80	79.01.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.01.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.01.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.01.466.1			
350* 50	79.02.192.1				600*250	79.01.482.1	30.72.805.1	30.73.805.1	30.89.846.1
350* 80	79.01.396.1				600*300	79.01.496.1	30.72.825.1	30.73.825.1	30.89.870.1
350*100	79.01.418.1				600*350	79.01.508.1	30.72.845.1	30.73.845.1	30.89.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.01.518.1	30.72.887.1	30.73.887.1	30.89.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.01.526.1	30.72.917.1	30.73.917.1	30.89.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.01.532.1	30.72.947.1	30.73.947.1	30.89.966.1
350*300	79.01.486.1	30.72.449.1	30.73.449.1	30.89.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-600	221.1	016.1
20	40-600	223.1	018.1
25	40-100	225.1	020.1
	150-600	226.1	024.1
40	50-100	230.1	026.1
	150-600	231.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.59.082.1			230 76.83.37.101.1
813	76.80.59.084.1			255 76.83.37.102.1
1219	76.80.59.086.1			305 76.83.37.103.1
1524	76.80.59.088.1			355 76.83.37.105.1
1829	76.80.59.090.1			405 76.83.37.106.1
2134	76.80.59.092.1			455 76.83.37.107.1
2438	76.80.59.094.1			
2743	76.80.59.096.1			
3048	76.80.59.098.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	* 80	61.157.1	15	4	1/2	* 80	61.157.1
20	4	5/8	* 90	61.271.1	20	4	5/8	* 90	61.271.1
25	4	5/8	* 90	61.271.1	25	4	5/8	* 90	61.271.1
40	4	3/4	* 110	61.330.1	40	4	3/4	* 110	61.330.1
50	8	5/8	* 110	61.274.1					
80	8	3/4	* 130	61.334.1					
100	8	7/8	* 150	61.406.1					
150	12	1	* 170	61.474.1					
200	12	1 1/8	* 190	61.535.1					
250	16	1 1/4	* 220	61.597.1					
300	20	1 1/4	* 220	61.597.1					
350	20	1 3/8	* 240	61.646.1					
400	20	1 1/2	* 250	61.688.1					
450	20	1 5/8	* 280	61.722.1					
500	24	1 5/8	* 290	61.724.1					
600	24	1 7/8	* 330	61.786.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	90	61.159.1	
					20	4	5/8	*	100	61.273.1	
					25	4	5/8	*	100	61.273.1	
					40	4	3/4	*	120	61.332.1	
50	8	5/8	*	150	61.281.1	50	8	5/8	*	120	61.276.1
80	8	3/4	*	150	61.337.1	80	8	3/4	*	150	61.337.1
100	8	7/8	*	160	61.407.1	100	8	7/8	*	170	61.409.1
150	12	1	*	180	61.475.1	150	12	1	*	210	61.480.1
200	12	1 1/8	*	210	61.538.1	200	12	1 1/8	*	230	61.541.1
250	16	1 1/4	*	230	61.598.1	250	16	1 1/4	*	260	61.603.1
300	20	1 1/4	*	240	61.600.1	300	20	1 1/4	*	270	61.605.1
350	20	1 3/8	*	260	61.649.1	350	20	1 3/8	*	290	61.654.1
400	20	1 1/2	*	280	61.693.1	400	20	1 1/2	*	310	61.698.1
450	20	1 5/8	*	300	61.725.1	450	20	1 5/8	*	340	61.732.1
500	24	1 5/8	*	320	61.728.1	500	24	1 5/8	*	360	61.736.1
600	24	1 7/8	*	360	61.791.1	600	24	1 7/8	*	420	61.802.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.36.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.36.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	
WELDING NECK FLANGE	1	76.62.79.804.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.36.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.36.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	
WELDING NECK FLANGE	2	76.62.79.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.36.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.20.36.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.20.36.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.30.12.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.62.79.802.1	

* VENT POINT	DN 20	FIG.1H	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.12.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.30.12.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

CLASS 62010

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -600	103.4	103.4	102.9	99.5	95.8	92.3	87.7	80.3	73.2	67.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	C	B	E	E	E	E	E	E	E	E	E	E	A	350 80
40	C	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	400 80
25	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	450 80
20	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	500 80
15	A	A	A	A	A	E	E	E	E	E	E	E	E	E	E	A	600 80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 62010	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 62010, REV.C PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-1.25CR CLASS 22
		DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A335-P11
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.11	021.1	029.1	037.1	053.1	061.1	069.1	077.1	086.1	098.1	110.1	122.1	133.1	143.1	453.1	463.1	483.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.64.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPECTACLE BLIND FLANGE		76.88.07	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	444.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	308.1	312.1	316.1	318.1	320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	344.1
WELDING NECK FLANGE		76.64.79	336.1	338.1	340.1	342.1	344.1	346.1	348.1	350.1	352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	417.1	427.1	437.1	447.1	457.1	467.1	477.1	487.1	497.1	507.1	517.1	537.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
* VALVES																		
CHECK VALVE FLANGED		77.13.60	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.23.60	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE FLANGED		77.33.60	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.64.95	142.1	144.1	146.1	148.1												
ORIFICE FLANGE SET		76.64.91					344.1	346.1	348.1	350.1	352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB
	76.	76.	76.	76.		76.	76.	76.
RUN* BR	.							
20* 15		32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.25.374.1		
25* 15		32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.25.398.1		
25* 20		32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.25.420.1		
40* 15		32.68.032.1	32.69.032.1		400*150	79.25.440.1	32.68.348.1	32.69.348.1
40* 20		32.68.042.1	32.69.042.1		400*200	79.25.458.1	32.68.352.1	32.69.352.1
40* 25		32.68.052.1	32.69.052.1		400*250	79.25.474.1	32.68.362.1	32.69.362.1
50* 20		32.68.066.1	32.69.066.1		400*300	79.25.488.1	32.68.372.1	32.69.372.1
50* 25		32.68.072.1	32.69.072.1		400*350	79.25.500.1	32.68.382.1	32.69.382.1
50* 40		32.68.082.1	32.69.082.1		450* 50	79.25.376.1		
80* 40		32.68.092.1	32.69.092.1		450* 80	79.25.400.1		
80* 50	79.25.360.1	32.68.102.1	32.69.102.1		450*100	79.25.422.1		
100* 40		32.68.116.1	32.69.116.1		450*150	79.25.442.1		
100* 50	79.25.362.1	32.68.126.1	32.69.126.1		450*200	79.25.460.1	32.68.388.1	32.69.388.1
100* 80	79.25.386.1	32.68.141.1	32.69.141.1		450*250	79.25.476.1	32.68.392.1	32.69.392.1
150* 50	79.25.364.1				450*300	79.25.490.1	32.68.402.1	32.69.402.1
150* 80	79.25.388.1	32.68.156.1	32.69.156.1		450*350	79.25.502.1	32.68.412.1	32.69.412.1
150*100	79.25.410.1	32.68.171.1	32.69.171.1		450*400	79.25.512.1	32.68.422.1	32.69.422.1
200* 50	79.25.366.1				500* 50	79.25.378.1		
200* 80	79.25.390.1				500* 80	79.25.402.1		
200*100	79.25.412.1	32.68.191.1	32.69.191.1		500*100	79.25.424.1		
200*150	79.25.432.1	32.68.216.1	32.69.216.1		500*150	79.25.444.1		
250* 50	79.25.368.1				500*200	79.25.462.1	32.68.433.1	32.69.433.1
250* 80	79.25.392.1				500*250	79.25.478.1	32.68.439.1	32.69.439.1
250*100	79.25.414.1	32.68.241.1	32.69.241.1		500*300	79.25.492.1	32.68.432.1	32.69.432.1
250*150	79.25.434.1	32.68.256.1	32.69.256.1		500*350	79.25.504.1	32.68.442.1	32.69.442.1
250*200	79.25.452.1	32.68.272.1	32.69.272.1		500*400	79.25.514.1	32.68.452.1	32.69.452.1
300* 50	79.25.370.1				500*450	79.25.522.1	32.68.463.1	32.69.463.1
300* 80	79.25.394.1				600* 50	79.25.382.1		
300*100	79.25.416.1				600* 80	79.25.406.1		
300*150	79.25.436.1	32.68.282.1	32.69.282.1		600*100	79.25.428.1		
300*200	79.25.454.1	32.68.292.1	32.69.292.1		600*150	79.25.448.1		
300*250	79.25.470.1	32.68.302.1	32.69.302.1		600*200	79.25.466.1		
350* 50	79.25.372.1				600*250	79.25.482.1	32.68.466.1	32.69.466.1
350* 80	79.25.396.1				600*300	79.25.496.1	32.68.469.1	32.69.469.1
350*100	79.25.418.1				600*350	79.25.508.1	32.68.486.1	32.69.486.1
350*150	79.25.438.1	32.68.312.1	32.69.312.1		600*400	79.25.518.1	32.68.472.1	32.69.472.1
350*200	79.25.456.1	32.68.322.1	32.69.322.1		600*450	79.25.526.1	32.68.483.1	32.69.483.1
350*250	79.25.472.1	32.68.332.1	32.69.332.1		600*500	79.25.532.1	32.68.493.1	32.69.493.1
350*300	79.25.486.1	32.68.342.1	32.69.342.1					

		BNIF	BNIP
		76.80.38	76.80.31
BRANCH	RUN-PIPE		
15	40-150	381.1	181.1
	200-600	382.1	182.1
20	40- 80	383.1	183.1
	100-600	384.1	184.1
25	40- 40	385.1	185.1
	50- 50	386.1	186.1
	80-100	387.1	187.1
	150-600	388.1	188.1
40	50- 50	390.1	189.1
	80- 80	391.1	190.1
	100-100	392.1	191.1
	150-300	393.1	193.1
	350-600	394.1	194.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.822.1		230	76.83.37.101.1
813	76.80.60.824.1		255	76.83.37.102.1
1219	76.80.60.826.1		305	76.83.37.103.1
1524	76.80.60.828.1		355	76.83.37.105.1
1829	76.80.60.830.1		405	76.83.37.106.1
2134	76.80.60.832.1		455	76.83.37.107.1
2438	76.80.60.834.1			
2743	76.80.60.836.1			
3048	76.80.60.838.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	80	15	4	1/2	*	80
20	4	5/8	*	90	20	4	5/8	*	90
25	4	5/8	*	90	25	4	5/8	*	90
40	4	3/4	*	110	40	4	3/4	*	110
50	8	5/8	*	110					
80	8	3/4	*	130					
100	8	7/8	*	150					
150	12	1	*	170					
200	12	1 1/8	*	190					
250	16	1 1/4	*	220					
300	20	1 1/4	*	220					
350	20	1 3/8	*	240					
400	20	1 1/2	*	250					
450	20	1 5/8	*	280					
500	24	1 5/8	*	290					
600	24	1 7/8	*	330					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230
250	16	1 1/4	*	230	250	16	1 1/4	*	260
300	20	1 1/4	*	240	300	20	1 1/4	*	270
350	20	1 3/8	*	260	350	20	1 3/8	*	290
400	20	1 1/2	*	280	400	20	1 1/2	*	310
450	20	1 5/8	*	300	450	20	1 5/8	*	340
500	24	1 5/8	*	320	500	24	1 5/8	*	360
600	24	1 7/8	*	360	600	24	1 7/8	*	420

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.60.103.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.23.60.104.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.96.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.23.60.104.1	
STUD BOLT WITH NUTS	8	81.38.96.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.60.103.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
	8	81.38.96.157.1	
WELDING NECK FLANGE	2	76.64.79.336.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.60.103.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
	4	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.60.103.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
	4	81.38.96.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.60.103.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
	8	81.38.96.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.985.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.96.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.985.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.96.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.33.60.103.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.33.60.104.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.96.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.33.60.104.1	
STUD BOLT WITH NUTS	8	81.38.96.271.1	

CLASS 62020

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -600	103.4	103.4	102.9	99.5	95.8	92.3	85.7	80.3	73.2	67.6

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	C	B	A											350 80
40	C	B	B	A													400 80
25	B	B	A														450 80
20	B	A															500 80
15	A																600 80

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 62020	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 62020, REV.C PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-1.25CR CLASS 22
		DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	---	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GABB	GATE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLBB	GLOBE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE	74.33.11	021.1	029.1	037.1	053.1	061.1	069.1	077.1	086.1	098.1	110.1	122.1	133.1	143.1	453.1	463.1	483.1
PIPE NIPPLE 50MM	76.32.57	431.1	441.1	451.1	471.1												
* FLANGES																	
BLIND FLANGE	76.64.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPECTACLE BLIND FLANGE	76.88.07	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	444.1
SPACER RING TYPE (ASME FLANGE)	76.88.18	308.1	312.1	316.1	318.1	320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	344.1
WELDING NECK FLANGE	76.64.79	336.1	338.1	340.1	342.1	344.1	346.1	348.1	350.1	352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1
* FITTINGS																	
CAP BUTT-WELD.END	76.32.18	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
ELBOW 45 DEG BUTT-WELD ENDS	76.32.38	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
ELBOW 90 DEG BUTT-WELD ENDS	76.32.39	377.1	387.1	397.1	407.1	417.1	427.1	437.1	447.1	457.1	467.1	477.1	487.1	497.1	507.1	517.1	537.1
EQUAL TEE BUTT-WELD ENDS	76.32.84	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
* VALVES																	
CHECK VALVE BUTT-WELD ENDS	77.14.64	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE BW BELLOWS SEALED	77.24.64	803.1	804.1	805.1	807.1												
GATE VALVE BUTT-WELD ENDS	77.24.64	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED	77.23.64	103.1	104.1	105.1	107.1	108.1											
GLOBE VALVE BW BELLOWS SEALED	77.34.64	803.1	804.1	805.1	807.1												
GLOBE VALVE BUTT-WELD ENDS	77.34.64	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN	76.64.95	142.1	144.1	146.1	148.1												
ORIFICE FLANGE SET	76.64.91					344.1	346.1	348.1	350.1	352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1

								BNIP		
					BROB	RECB	REEB	76.80.31		
					76.	76.	76.			
RUN* BR					76.	76.	76.	BRANCH	RUN-PIPE	
20* 15		32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.25.374.1		15	40-150	181.1
25* 15		32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.25.398.1			200-600	182.1
25* 20		32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.25.420.1		20	40- 80	183.1
40* 15		32.68.032.1	32.69.032.1		400*150	79.25.440.1	32.68.348.1		100-600	184.1
40* 20		32.68.042.1	32.69.042.1		400*200	79.25.458.1	32.68.352.1	25	40- 40	185.1
40* 25		32.68.052.1	32.69.052.1		400*250	79.25.474.1	32.68.362.1		50- 50	186.1
50* 20		32.68.066.1	32.69.066.1		400*300	79.25.488.1	32.68.372.1		80-100	187.1
50* 25		32.68.072.1	32.69.072.1		400*350	79.25.500.1	32.68.382.1		150-600	188.1
50* 40		32.68.082.1	32.69.082.1		450* 50	79.25.376.1		40	50- 50	189.1
80* 40		32.68.092.1	32.69.092.1		450* 80	79.25.400.1			80- 80	190.1
80* 50	79.25.360.1	32.68.102.1	32.69.102.1		450*100	79.25.422.1			100-100	191.1
100* 40		32.68.116.1	32.69.116.1		450*150	79.25.442.1			150-300	193.1
100* 50	79.25.362.1	32.68.126.1	32.69.126.1		450*200	79.25.460.1	32.68.388.1		350-600	194.1
100* 80	79.25.386.1	32.68.141.1	32.69.141.1		450*250	79.25.476.1	32.68.392.1			
150* 50	79.25.364.1				450*300	79.25.490.1	32.68.402.1			
150* 80	79.25.388.1	32.68.156.1	32.69.156.1		450*350	79.25.502.1	32.68.412.1			
150*100	79.25.410.1	32.68.171.1	32.69.171.1		450*400	79.25.512.1	32.68.422.1			
200* 50	79.25.366.1				500* 50	79.25.378.1				
200* 80	79.25.390.1				500* 80	79.25.402.1				
200*100	79.25.412.1	32.68.191.1	32.69.191.1		500*100	79.25.424.1				
200*150	79.25.432.1	32.68.216.1	32.69.216.1		500*150	79.25.444.1				
250* 50	79.25.368.1				500*200	79.25.462.1	32.68.433.1			
250* 80	79.25.392.1				500*250	79.25.478.1	32.68.439.1			
250*100	79.25.414.1	32.68.241.1	32.69.241.1		500*300	79.25.492.1	32.68.432.1			
250*150	79.25.434.1	32.68.256.1	32.69.256.1		500*350	79.25.504.1	32.68.442.1			
250*200	79.25.452.1	32.68.272.1	32.69.272.1		500*400	79.25.514.1	32.68.452.1			
300* 50	79.25.370.1				500*450	79.25.522.1	32.68.463.1			
300* 80	79.25.394.1				600* 50	79.25.382.1				
300*100	79.25.416.1				600* 80	79.25.406.1				
300*150	79.25.436.1	32.68.282.1	32.69.282.1		600*100	79.25.428.1				
300*200	79.25.454.1	32.68.292.1	32.69.292.1		600*150	79.25.448.1				
300*250	79.25.470.1	32.68.302.1	32.69.302.1		600*200	79.25.466.1				
350* 50	79.25.372.1				600*250	79.25.482.1	32.68.466.1			
350* 80	79.25.396.1				600*300	79.25.496.1	32.68.469.1			
350*100	79.25.418.1				600*350	79.25.508.1	32.68.486.1			
350*150	79.25.438.1	32.68.312.1	32.69.312.1		600*400	79.25.518.1	32.68.472.1			
350*200	79.25.456.1	32.68.322.1	32.69.322.1		600*450	79.25.526.1	32.68.483.1			
350*250	79.25.472.1	32.68.332.1	32.69.332.1		600*500	79.25.532.1	32.68.493.1			
350*300	79.25.486.1	32.68.342.1	32.69.342.1							

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	80	96.157.1	15	4	1/2	*	80	96.157.1
20	4	5/8	*	90	96.271.1	20	4	5/8	*	90	96.271.1
25	4	5/8	*	90	96.271.1	25	4	5/8	*	90	96.271.1
40	4	3/4	*	110	96.330.1	40	4	3/4	*	110	96.330.1
50	8	5/8	*	110	96.274.1						
80	8	3/4	*	130	96.334.1						
100	8	7/8	*	150	96.406.1						
150	12	1	*	170	96.474.1						
200	12	1 1/8	*	190	96.535.1						
250	16	1 1/4	*	220	96.597.1						
300	20	1 1/4	*	220	96.597.1						
350	20	1 3/8	*	240	96.646.1						
400	20	1 1/2	*	250	96.688.1						
450	20	1 5/8	*	280	96.722.1						
500	24	1 5/8	*	290	96.724.1						
600	24	1 7/8	*	330	96.786.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
						15	4	1/2	*	90	96.159.1
						20	4	5/8	*	100	96.273.1
						25	4	5/8	*	100	96.273.1
						40	4	3/4	*	120	96.332.1
50	8	5/8	*	150	96.281.1	50	8	5/8	*	120	96.276.1
80	8	3/4	*	150	96.337.1	80	8	3/4	*	150	96.337.1
100	8	7/8	*	160	96.407.1	100	8	7/8	*	170	96.409.1
150	12	1	*	180	96.475.1	150	12	1	*	210	96.480.1
200	12	1 1/8	*	210	96.538.1	200	12	1 1/8	*	230	96.541.1
250	16	1 1/4	*	230	96.598.1	250	16	1 1/4	*	260	96.603.1
300	20	1 1/4	*	240	96.600.1	300	20	1 1/4	*	270	96.605.1
350	20	1 3/8	*	260	96.649.1	350	20	1 3/8	*	290	96.654.1
400	20	1 1/2	*	280	96.693.1	400	20	1 1/2	*	310	96.698.1
450	20	1 5/8	*	300	96.725.1	450	20	1 5/8	*	340	96.732.1
500	24	1 5/8	*	320	96.728.1	500	24	1 5/8	*	360	96.736.1
600	24	1 7/8	*	360	96.791.1	600	24	1 7/8	*	420	96.802.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.64.103.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.64.104.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	4	81.38.96.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.64.104.1	
STUD BOLT WITH NUTS	4	81.38.96.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	2	77.24.64.103.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
WELDING NECK FLANGE	2	76.64.79.336.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.64.103.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.64.103.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.64.103.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
	8	81.38.96.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.985.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.96.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.985.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.96.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.64.103.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.64.104.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	4	81.38.96.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.64.104.1	
STUD BOLT WITH NUTS	4	81.38.96.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

CLASS 62040

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -600	103.4	103.2	102.2	98.5	97.3	92.6	85.7	80.3	72.6	67.0

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.13
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	C	B	E	E	E	E	E	E	E	E	E	E	A	350 80
40	C	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	400 80
25	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	450 80
20	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	500 80
15	A	A	A	A	A	E	E	E	E	E	E	E	E	E	E	A	600 80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (5CR-0.5MO)	PLANT :	
CLASS NO. : 62040	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 62040, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P5
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-5CR CLASS 22
		---	ASTM A335-P5

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F5
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F5
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F5
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-5
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-5
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F5

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP5
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP5

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F5
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F5
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F5
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP5
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP5
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP5

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A217-C5,A182-F5 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L) ,GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A335-P5
MTRR	METER RUN	DN 15- 40	ASTM A182-F5/A335-P5
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F5
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE															
		15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600
ITEM DESCRIPTION	MESC																

* PIPE																	
PIPE	74.33.01	021.1	029.1	037.1	053.1	061.1	069.1	077.1	086.1	098.1	110.1	122.1	133.1	143.1	453.1	463.1	483.1
* FLANGES																	
BLIND FLANGE	76.64.11	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPECTACLE BLIND FLANGE	76.88.08	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	444.1
SPACER RING TYPE (ASME FLANGE)	76.88.18	708.1	712.1	716.1	718.1	720.1	722.1	724.1	726.1	728.1	730.1	732.1	734.1	736.1	738.1	740.1	744.1
WELDING NECK FLANGE	76.64.80	308.1	312.1	316.1	318.1	320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	342.1
* FITTINGS																	
CAP BUTT-WELD.END	76.32.18	170.1	176.1	180.1	187.1	207.1	227.1	247.1	267.1	287.1	297.1	307.1	317.1	327.1	337.1	347.1	357.1
ELBOW 45 DEG BUTT-WELD ENDS	76.32.38	170.1	176.1	180.1	187.1	207.1	227.1	247.1	267.1	287.1	297.1	307.1	317.1	327.1	337.1	347.1	357.1
ELBOW 90 DEG BUTT-WELD ENDS	76.32.39	657.1	667.1	677.1	687.1	707.1	727.1	747.1	767.1	787.1	807.1	817.1	827.1	837.1	847.1	857.1	867.1
EQUAL TEE BUTT-WELD ENDS	76.32.84	170.1	176.1	180.1	187.1	207.1	227.1	247.1	267.1	287.1	297.1	307.1	317.1	327.1	337.1	347.1	357.1
* VALVES																	
CHECK VALVE FLANGED	77.13.50	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED	77.23.50	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE FLANGED	77.33.50	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.41.46	404.1	406.1	408.1	412.1	414.1	418.1	420.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	442.1
METER RUN	76.64.95	242.1	244.1	246.1	248.1												
ORIFICE FLANGE SET	76.64.92					320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	342.1

RUN* BR	BROB	RECB	REEB	TERB				BROB	RECB	REEB			
	76.	76.	76.	76.				76.	76.	76.			
20* 15		32.66.002.1	32.67.002.1	32.85.520.1	400* 50	79.41.374.1							
25* 15		32.66.012.1	32.67.012.1	32.85.530.1	400* 80	79.41.398.1							
25* 20		32.66.022.1	32.67.022.1	32.85.540.1	400*100	79.41.420.1							
40* 15		32.66.032.1	32.67.032.1		400*150	79.41.440.1	32.66.348.1	32.67.348.1					
40* 20		32.66.042.1	32.67.042.1		400*200	79.41.458.1	32.66.352.1	32.67.352.1					
40* 25		32.66.052.1	32.67.052.1		400*250	79.41.474.1	32.66.362.1	32.67.362.1					
50* 20		32.66.066.1	32.67.066.1		400*300	79.41.488.1	32.66.372.1	32.67.372.1					
50* 25		32.66.072.1	32.67.072.1		400*350	79.41.500.1	32.66.382.1	32.67.382.1					
50* 40		32.66.082.1	32.67.082.1		450* 50	79.41.376.1							
80* 40		32.66.092.1	32.67.092.1		450* 80	79.41.400.1							
80* 50	79.41.360.1	32.66.102.1	32.67.102.1		450*100	79.41.422.1							
100* 40		32.66.116.1	32.67.116.1		450*150	79.41.442.1							
100* 50	79.41.362.1	32.66.126.1	32.67.126.1		450*200	79.41.460.1	32.66.388.1	32.67.388.1					
100* 80	79.41.386.1	32.66.141.1	32.67.141.1		450*250	79.41.476.1	32.66.392.1	32.67.392.1					
150* 50	79.41.364.1				450*300	79.41.490.1	32.66.402.1	32.67.402.1					
150* 80	79.41.388.1	32.66.156.1	32.67.156.1		450*350	79.41.502.1	32.66.412.1	32.67.412.1					
150*100	79.41.410.1	32.66.171.1	32.67.171.1		450*400	79.41.512.1	32.66.422.1	32.67.422.1					
200* 50	79.41.366.1				500* 50	79.41.378.1							
200* 80	79.41.390.1				500* 80	79.41.402.1							
200*100	79.41.412.1	32.66.191.1	32.67.191.1		500*100	79.41.424.1							
200*150	79.41.432.1	32.66.216.1	32.67.216.1		500*150	79.41.444.1							
250* 50	79.41.368.1				500*200	79.41.462.1	32.66.433.1	32.67.433.1					
250* 80	79.41.392.1				500*250	79.41.478.1	32.66.439.1	32.67.439.1					
250*100	79.41.414.1	32.66.241.1	32.67.241.1		500*300	79.41.492.1	32.66.432.1	32.67.432.1					
250*150	79.41.434.1	32.66.256.1	32.67.256.1		500*350	79.41.504.1	32.66.442.1	32.67.442.1					
250*200	79.41.452.1	32.66.272.1	32.67.272.1		500*400	79.41.514.1	32.66.452.1	32.67.452.1					
300* 50	79.41.370.1				500*450	79.41.522.1	32.66.463.1	32.67.463.1					
300* 80	79.41.394.1				600* 50	79.41.382.1							
300*100	79.41.416.1				600* 80	79.41.406.1							
300*150	79.41.436.1	32.66.282.1	32.67.282.1		600*100	79.41.428.1							
300*200	79.41.454.1	32.66.292.1	32.67.292.1		600*150	79.41.448.1							
300*250	79.41.470.1	32.66.302.1	32.67.302.1		600*200	79.41.466.1							
350* 50	79.41.372.1				600*250	79.41.482.1	32.66.466.1	32.67.466.1					
350* 80	79.41.396.1				600*300	79.41.496.1	32.66.469.1	32.67.469.1					
350*100	79.41.418.1				600*350	79.41.508.1	32.66.486.1	32.67.486.1					
350*150	79.41.438.1	32.66.312.1	32.67.312.1		600*400	79.41.518.1	32.66.472.1	32.67.472.1					
350*200	79.41.456.1	32.66.322.1	32.67.322.1		600*450	79.41.526.1	32.66.483.1	32.67.483.1					
350*250	79.41.472.1	32.66.332.1	32.67.332.1		600*500	79.41.532.1	32.66.493.1	32.67.493.1					
350*300	79.41.486.1	32.66.342.1	32.67.342.1										

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.38	76.80.31
15	40-150	181.1	251.1
	200-600	182.1	252.1
20	40- 80	183.1	253.1
	100-600	184.1	254.1
25	40- 40	185.1	255.1
	50- 50	186.1	256.1
	80-100	187.1	257.1
	150-600	188.1	258.1
40	50- 50	190.1	259.1
	80- 80	191.1	260.1
	100-100	192.1	261.1
	150-300	193.1	263.1
	350-600	194.1	264.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.60.782.1	230	76.83.37.101.1
813	76.80.60.784.1	255	76.83.37.102.1
1219	76.80.60.786.1	305	76.83.37.103.1
1524	76.80.60.788.1	355	76.83.37.105.1
1829	76.80.60.790.1	405	76.83.37.106.1
2134	76.80.60.792.1	455	76.83.37.107.1
2438	76.80.60.794.1		
2743	76.80.60.796.1		
3048	76.80.60.798.1		

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	*	80	15	4	1/2	*	80
20	4	5/8	*	90	20	4	5/8	*	90
25	4	5/8	*	90	25	4	5/8	*	90
40	4	3/4	*	110	40	4	3/4	*	110
50	8	5/8	*	110					
80	8	3/4	*	130					
100	8	7/8	*	150					
150	12	1	*	170					
200	12	1 1/8	*	190					
250	16	1 1/4	*	220					
300	20	1 1/4	*	220					
350	20	1 3/8	*	240					
400	20	1 1/2	*	250					
450	20	1 5/8	*	280					
500	24	1 5/8	*	290					
600	24	1 7/8	*	330					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230
250	16	1 1/4	*	230	250	16	1 1/4	*	260
300	20	1 1/4	*	240	300	20	1 1/4	*	270
350	20	1 3/8	*	260	350	20	1 3/8	*	290
400	20	1 1/2	*	280	400	20	1 1/2	*	310
450	20	1 5/8	*	300	450	20	1 5/8	*	340
500	24	1 5/8	*	320	500	24	1 5/8	*	360
600	24	1 7/8	*	360	600	24	1 7/8	*	420

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.50.103.1	
PIPE NIPPLE 50MM	1	76.32.57.231.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.80.308.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GATE VALVE FLANGED	1	77.23.50.104.1	
PIPE NIPPLE 50MM	1	76.32.57.241.1	
STUD BOLT WITH NUTS	8	81.38.96.271.1	
WELDING NECK FLANGE	1	76.64.80.312.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GATE VALVE FLANGED	1	77.23.50.104.1	
STUD BOLT WITH NUTS	8	81.38.96.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.404.1	
GATE VALVE FLANGED	2	77.23.50.103.1	
LAP-JOINT FLANGE	2	76.64.20.458.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
	8	81.38.96.157.1	
WELDING NECK FLANGE	2	76.64.80.308.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.50.103.1	
LAP-JOINT FLANGE	1	76.64.20.458.1	
PIPE NIPPLE 50MM	1	76.32.57.231.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
	4	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.80.308.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GATE VALVE FLANGED	1	77.23.50.103.1	
LAP-JOINT FLANGE	1	76.64.20.458.1	
STUD BOLT WITH NUTS	4	81.38.96.157.1	
	4	81.38.96.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.404.1	
GATE VALVE FLANGED	2	77.23.50.103.1	
LAP-JOINT FLANGE	2	76.64.20.458.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
	8	81.38.96.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.585.1	
GASKET, SPIRAL WOUND	1	85.41.46.412.1	
STUD BOLT WITH NUTS	4	81.38.96.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.585.1	
GASKET, SPIRAL WOUND	1	85.41.46.412.1	
STUD BOLT WITH NUTS	4	81.38.96.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.208.1	
GASKET, SPIRAL WOUND	2	85.41.46.404.1	
GLOBE VALVE FLANGED	1	77.33.50.103.1	
PIPE NIPPLE 50MM	1	76.32.57.231.1	
STUD BOLT WITH NUTS	8	81.38.96.157.1	
WELDING NECK FLANGE	1	76.64.80.308.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GLOBE VALVE FLANGED	1	77.33.50.104.1	
PIPE NIPPLE 50MM	1	76.32.57.241.1	
STUD BOLT WITH NUTS	8	81.38.96.271.1	
WELDING NECK FLANGE	1	76.64.80.312.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.11.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.406.1	
GLOBE VALVE FLANGED	1	77.33.50.104.1	
STUD BOLT WITH NUTS	8	81.38.96.271.1	

CLASS 62110

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400
		PRESSURE BAR GA								
DN15	-600	103.4	103.4	102.9	99.5	95.8	92.3	85.7	80.3	73.2

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	25 80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	40 80
350	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	50 80
300	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	80 80
250	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	100 80
200	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	150 80
150	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	200 80
100	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	250 80
80	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	300 80
50	C	C	C	C	B	E	E	E	E	E	E	E	E	E	E	A	350 80
40	C	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	400 80
25	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	450 80
20	B	B	B	B	A	E	E	E	E	E	E	E	E	E	E	A	500 80
15	A	A	A	A	A	E	E	E	E	E	E	E	E	E	E	A	600 80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 62110	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 62110, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-1.25CR CLASS 22
		DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

62110, REV.B PAGE 3

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.11	021.1	029.1	037.1	053.1	061.1	069.1	077.1	086.1	098.1	110.1	122.1	133.1	143.1	453.1	463.1	483.1
PIPE NIPPLE	50MM	76.32.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.64.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPECTACLE BLIND FLANGE		76.88.07	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	444.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	308.1	312.1	316.1	318.1	320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	344.1
WELDING NECK FLANGE		76.64.79	336.1	338.1	340.1	342.1	344.1	346.1	348.1	350.1	352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	417.1	427.1	437.1	447.1	457.1	467.1	477.1	487.1	497.1	507.1	517.1	537.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.14.65	403.1	404.1	405.1	406.1	408.1	410.1	412.1	414.1	415.1	416.1	417.1	418.1	419.1	420.1	421.1	423.1
GATE VALVE BUTT-WELD ENDS		77.24.65	403.1	404.1	405.1	407.1	408.1	410.1	412.1	414.1	415.1	416.1	417.1	418.1	419.1	420.1	421.1	423.1
GATE VALVE FLANGED		77.23.65	103.1	104.1	105.1	107.1	108.1											
GLOBE VALVE BUTT-WELD ENDS		77.34.65	403.1	404.1	405.1	407.1	408.1	410.1	412.1	414.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.64.95	142.1	144.1	146.1	148.1												
ORIFICE FLANGE SET		76.64.91					344.1	346.1	348.1	350.1	352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1

BROB				RECB				REEB				TERB				BROB				RECB				REEB				BNIF				BNIP																			
76.				76.				76.				76.				76.				76.				76.				76.80.38				76.80.31																			
RUN* BR																								BRANCH				RUN-PIPE																							
20* 15				32.68.002.1				32.69.002.1				32.86.003.1				400* 50				79.25.374.1								15				40-150				381.1				181.1											
25* 15				32.68.012.1				32.69.012.1				32.86.011.1				400* 80				79.25.398.1												200-600				382.1				182.1											
25* 20				32.68.022.1				32.69.022.1				32.86.019.1				400*100				79.25.420.1								20				40- 80				383.1				183.1											
40* 15				32.68.032.1				32.69.032.1								400*150				79.25.440.1				32.68.348.1				32.69.348.1								100-600				384.1				184.1							
40* 20				32.68.042.1				32.69.042.1								400*200				79.25.458.1				32.68.352.1				32.69.352.1								25				40- 40				385.1				185.1			
40* 25				32.68.052.1				32.69.052.1								400*250				79.25.474.1				32.68.362.1				32.69.362.1								50- 50				386.1				186.1							
50* 20				32.68.066.1				32.69.066.1								400*300				79.25.488.1				32.68.372.1				32.69.372.1								80-100				387.1				187.1							
50* 25				32.68.072.1				32.69.072.1								400*350				79.25.500.1				32.68.382.1				32.69.382.1								150-600				388.1				188.1							
50* 40				32.68.082.1				32.69.082.1								450* 50				79.25.376.1												40				50- 50				390.1				189.1							
80* 40				32.68.092.1				32.69.092.1								450* 80				79.25.400.1																80- 80				391.1				190.1							
80* 50				79.25.360.1				32.68.102.1				32.69.102.1				450*100				79.25.422.1												100-100				392.1				191.1											
100* 40								32.68.116.1				32.69.116.1				450*150				79.25.442.1												150-300				393.1				193.1											
100* 50				79.25.362.1				32.68.126.1				32.69.126.1				450*200				79.25.460.1				32.68.388.1				32.69.388.1								350-600				394.1				194.1							
100* 80				79.25.386.1				32.68.141.1				32.69.141.1				450*250				79.25.476.1				32.68.392.1				32.69.392.1																							
150* 50				79.25.364.1												450*300				79.25.490.1				32.68.402.1				32.69.402.1																							
150* 80				79.25.388.1				32.68.156.1				32.69.156.1				450*350				79.25.502.1				32.68.412.1				32.69.412.1																							
150*100				79.25.410.1				32.68.171.1				32.69.171.1				450*400				79.25.512.1				32.68.422.1				32.69.422.1																							
200* 50				79.25.366.1												500* 50				79.25.378.1																															
200* 80				79.25.390.1												500* 80				79.25.402.1																															
200*100				79.25.412.1				32.68.191.1				32.69.191.1				500*100				79.25.424.1																															
200*150				79.25.432.1				32.68.216.1				32.69.216.1				500*150				79.25.444.1																															
250* 50				79.25.368.1												500*200				79.25.462.1				32.68.433.1				32.69.433.1																							
250* 80				79.25.392.1												500*250				79.25.478.1				32.68.439.1				32.69.439.1																							
250*100				79.25.414.1				32.68.241.1				32.69.241.1				500*300				79.25.492.1				32.68.432.1				32.69.432.1																							
250*150				79.25.434.1				32.68.256.1				32.69.256.1				500*350				79.25.504.1				32.68.442.1				32.69.442.1												230				76.83.37.101.1							
250*200				79.25.452.1				32.68.272.1				32.69.272.1				500*400				79.25.514.1				32.68.452.1				32.69.452.1												255				76.83.37.102.1							
300* 50				79.25.370.1												500*450				79.25.522.1				32.68.463.1				32.69.463.1												305				76.83.37.103.1							
300* 80				79.25.394.1												600* 50				79.25.382.1																355				76.83.37.105.1											
300*100				79.25.416.1												600* 80				79.25.406.1																405				76.83.37.106.1											
300*150				79.25.436.1				32.68.282.1				32.69.282.1				600*100				79.25.428.1																455				76.83.37.107.1											
300*200				79.25.454.1				32.68.292.1				32.69.292.1				600*150				79.25.448.1																															
300*250				79.25.470.1				32.68.302.1				32.69.302.1				600*200				79.25.466.1																															
350* 50				79.25.372.1												600*250				79.25.482.1				32.68.466.1				32.69.466.1																							
350* 80				79.25.396.1												600*300				79.25.496.1				32.68.469.1				32.69.469.1																							
350*100				79.25.418.1												600*350				79.25.508.1				32.68.486.1				32.69.486.1																							
350*150				79.25.438.1				32.68.312.1				32.69.312.1				600*400				79.25.518.1				32.68.472.1				32.69.472.1																							
350*200				79.25.456.1				32.68.322.1				32.69.322.1				600*450				79.25.526.1				32.68.483.1				32.69.483.1																							
350*250				79.25.472.1				32.68.332.1				32.69.332.1				600*500				79.25.532.1				32.68.493.1				32.69.493.1																							
350*300				79.25.486.1				32.68.342.1				32.69.342.1																																							

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	80	61.157.1	15	4	1/2	*	80	61.157.1
20	4	5/8	*	90	61.271.1	20	4	5/8	*	90	61.271.1
25	4	5/8	*	90	61.271.1	25	4	5/8	*	90	61.271.1
40	4	3/4	*	110	61.330.1	40	4	3/4	*	110	61.330.1
50	8	5/8	*	110	61.274.1						
80	8	3/4	*	130	61.334.1						
100	8	7/8	*	150	61.406.1						
150	12	1	*	170	61.474.1						
200	12	1 1/8	*	190	61.535.1						
250	16	1 1/4	*	220	61.597.1						
300	20	1 1/4	*	220	61.597.1						
350	20	1 3/8	*	240	61.646.1						
400	20	1 1/2	*	250	61.688.1						
450	20	1 5/8	*	280	61.722.1						
500	24	1 5/8	*	290	61.724.1						
600	24	1 7/8	*	330	61.786.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	90	61.159.1	
					20	4	5/8	*	100	61.273.1	
					25	4	5/8	*	100	61.273.1	
					40	4	3/4	*	120	61.332.1	
50	8	5/8	*	150	61.281.1	50	8	5/8	*	120	61.276.1
80	8	3/4	*	150	61.337.1	80	8	3/4	*	150	61.337.1
100	8	7/8	*	160	61.407.1	100	8	7/8	*	170	61.409.1
150	12	1	*	180	61.475.1	150	12	1	*	210	61.480.1
200	12	1 1/8	*	210	61.538.1	200	12	1 1/8	*	230	61.541.1
250	16	1 1/4	*	230	61.598.1	250	16	1 1/4	*	260	61.603.1
300	20	1 1/4	*	240	61.600.1	300	20	1 1/4	*	270	61.605.1
350	20	1 3/8	*	260	61.649.1	350	20	1 3/8	*	290	61.654.1
400	20	1 1/2	*	280	61.693.1	400	20	1 1/2	*	310	61.698.1
450	20	1 5/8	*	300	61.725.1	450	20	1 5/8	*	340	61.732.1
500	24	1 5/8	*	320	61.728.1	500	24	1 5/8	*	360	61.736.1
600	24	1 7/8	*	360	61.791.1	600	24	1 7/8	*	420	61.802.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.403.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.404.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.404.1	
STUD BOLT WITH NUTS	4	81.38.61.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	2	77.24.65.403.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	2	76.64.79.336.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.403.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.403.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.65.103.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.985.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.985.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.65.403.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.65.404.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.65.404.1	
STUD BOLT WITH NUTS	4	81.38.61.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

CLASS 62120

DESIGN LIMITS											
TEMPERATURE IN DEGREES CELSIUS											
	0	50	100	150	200	250	300	350	400	450	500

	PRESSURE BAR GA										
DN15 -600	103.4	103.4	102.9	99.5	95.8	92.3	85.7	80.3	73.2	67.6	55.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES																TABLE OF SCHEDULES		
RUN SIZE	BRANCH SIZE															DN	SCHEDULE	
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600			
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15	80
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20	80
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25	80
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40	80
350	C	C	C	C	E	E	E	E	E	E	E	E	A				50	80
300	C	C	C	C	E	E	E	E	E	E	E	A					80	80
250	C	C	C	C	E	E	E	E	E	E	A						100	80
200	C	C	C	C	E	E	E	E	A								150	80
150	C	C	C	C	E	E	E	A									200	80
100	C	C	C	C	E	E	A										250	80
80	C	C	C	C	E	A											300	80
50	C	C	C	B	A												350	80
40	C	B	B	A													400	80
25	B	B	A														450	80
20	B	A															500	80
15	A																600	80

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 62120	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 62120, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN450-600	ASTM A691-1.25CR CLASS 22
		DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/194-8C
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

62120, REV.B PAGE 3

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE															
			15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.33.11	021.1	029.1	037.1	053.1	061.1	069.1	077.1	086.1	098.1	110.1	122.1	133.1	143.1	453.1	463.1	483.1
PIPE NIPPLE	50MM	76.32.57	431.1	441.1	451.1	471.1												
* FLANGES																		
BLIND FLANGE		76.64.10	208.1	212.1	216.1	218.1	220.1	222.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1	240.1	244.1
SPECTACLE BLIND FLANGE		76.88.07	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	444.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	308.1	312.1	316.1	318.1	320.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	338.1	340.1	344.1
WELDING NECK FLANGE		76.64.79	336.1	338.1	340.1	342.1	344.1	346.1	348.1	350.1	352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1
* FITTINGS																		
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	417.1	427.1	437.1	447.1	457.1	467.1	477.1	487.1	497.1	507.1	517.1	537.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	037.1	047.1	057.1	067.1	077.1	087.1	097.1	107.1	117.1	127.1	137.1	157.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.14.65	403.1	404.1	405.1	406.1	408.1	410.1	412.1	414.1	415.1	416.1	417.1	418.1	419.1	420.1	421.1	423.1
GATE VALVE BUTT-WELD ENDS		77.24.65	403.1	404.1	405.1	407.1	408.1	410.1	412.1	414.1	415.1	416.1	417.1	418.1	419.1	420.1	421.1	423.1
GATE VALVE FLANGED		77.23.65	103.1	104.1	105.1	107.1	108.1											
GLOBE VALVE BUTT-WELD ENDS		77.34.65	403.1	404.1	405.1	407.1	408.1	410.1	412.1	414.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.64.95	142.1	144.1	146.1	148.1												
ORIFICE FLANGE SET		76.64.91					344.1	346.1	348.1	350.1	352.1	354.1	356.1	358.1	360.1	362.1	364.1	366.1

BROB				RECB				REEB				TERB				BROB				RECB				REEB				BNIF				BNIP																			
76.				76.				76.				76.				76.				76.				76.				76.80.38				76.80.31																			
RUN* BR																								BRANCH				RUN-PIPE																							
20* 15				32.68.002.1				32.69.002.1				32.86.003.1				400* 50				79.25.374.1								15				40-150				381.1				181.1											
25* 15				32.68.012.1				32.69.012.1				32.86.011.1				400* 80				79.25.398.1												200-600				382.1				182.1											
25* 20				32.68.022.1				32.69.022.1				32.86.019.1				400*100				79.25.420.1								20				40- 80				383.1				183.1											
40* 15				32.68.032.1				32.69.032.1								400*150				79.25.440.1				32.68.348.1				32.69.348.1								100-600				384.1				184.1							
40* 20				32.68.042.1				32.69.042.1								400*200				79.25.458.1				32.68.352.1				32.69.352.1								25				40- 40				385.1				185.1			
40* 25				32.68.052.1				32.69.052.1								400*250				79.25.474.1				32.68.362.1				32.69.362.1								50- 50				386.1				186.1							
50* 20				32.68.066.1				32.69.066.1								400*300				79.25.488.1				32.68.372.1				32.69.372.1								80-100				387.1				187.1							
50* 25				32.68.072.1				32.69.072.1								400*350				79.25.500.1				32.68.382.1				32.69.382.1								150-600				388.1				188.1							
50* 40				32.68.082.1				32.69.082.1								450* 50				79.25.376.1												40				50- 50				390.1				189.1							
80* 40				32.68.092.1				32.69.092.1								450* 80				79.25.400.1																80- 80				391.1				190.1							
80* 50				79.25.360.1				32.68.102.1				32.69.102.1				450*100				79.25.422.1												100-100				392.1				191.1											
100* 40								32.68.116.1				32.69.116.1				450*150				79.25.442.1												150-300				393.1				193.1											
100* 50				79.25.362.1				32.68.126.1				32.69.126.1				450*200				79.25.460.1				32.68.388.1				32.69.388.1								350-600				394.1				194.1							
100* 80				79.25.386.1				32.68.141.1				32.69.141.1				450*250				79.25.476.1				32.68.392.1				32.69.392.1																							
150* 50				79.25.364.1												450*300				79.25.490.1				32.68.402.1				32.69.402.1																							
150* 80				79.25.388.1				32.68.156.1				32.69.156.1				450*350				79.25.502.1				32.68.412.1				32.69.412.1																							
150*100				79.25.410.1				32.68.171.1				32.69.171.1				450*400				79.25.512.1				32.68.422.1				32.69.422.1																							
200* 50				79.25.366.1												500* 50				79.25.378.1																															
200* 80				79.25.390.1												500* 80				79.25.402.1																															
200*100				79.25.412.1				32.68.191.1				32.69.191.1				500*100				79.25.424.1																															
200*150				79.25.432.1				32.68.216.1				32.69.216.1				500*150				79.25.444.1																															
250* 50				79.25.368.1												500*200				79.25.462.1				32.68.433.1				32.69.433.1																							
250* 80				79.25.392.1												500*250				79.25.478.1				32.68.439.1				32.69.439.1																							
250*100				79.25.414.1				32.68.241.1				32.69.241.1				500*300				79.25.492.1				32.68.432.1				32.69.432.1																							
250*150				79.25.434.1				32.68.256.1				32.69.256.1				500*350				79.25.504.1				32.68.442.1				32.69.442.1												230				76.83.37.101.1							
250*200				79.25.452.1				32.68.272.1				32.69.272.1				500*400				79.25.514.1				32.68.452.1				32.69.452.1												255				76.83.37.102.1							
300* 50				79.25.370.1												500*450				79.25.522.1				32.68.463.1				32.69.463.1												305				76.83.37.103.1							
300* 80				79.25.394.1												600* 50				79.25.382.1																355				76.83.37.105.1											
300*100				79.25.416.1												600* 80				79.25.406.1																405				76.83.37.106.1											
300*150				79.25.436.1				32.68.282.1				32.69.282.1				600*100				79.25.428.1																455				76.83.37.107.1											
300*200				79.25.454.1				32.68.292.1				32.69.292.1				600*150				79.25.448.1																															
300*250				79.25.470.1				32.68.302.1				32.69.302.1				600*200				79.25.466.1																															
350* 50				79.25.372.1												600*250				79.25.482.1				32.68.466.1				32.69.466.1																							
350* 80				79.25.396.1												600*300				79.25.496.1				32.68.469.1				32.69.469.1																							
350*100				79.25.418.1												600*350				79.25.508.1				32.68.486.1				32.69.486.1																							
350*150				79.25.438.1				32.68.312.1				32.69.312.1				600*400				79.25.518.1				32.68.472.1				32.69.472.1																							
350*200				79.25.456.1				32.68.322.1				32.69.322.1				600*450				79.25.526.1				32.68.483.1				32.69.483.1																							
350*250				79.25.472.1				32.68.332.1				32.69.332.1				600*500				79.25.532.1				32.68.493.1				32.69.493.1																							
350*300				79.25.486.1				32.68.342.1				32.69.342.1																																							

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	80	97.157.1	15	4	1/2	*	80	97.157.1
20	4	5/8	*	90	97.271.1	20	4	5/8	*	90	97.271.1
25	4	5/8	*	90	97.271.1	25	4	5/8	*	90	97.271.1
40	4	3/4	*	110	97.330.1	40	4	3/4	*	110	97.330.1
50	8	5/8	*	110	97.274.1						
80	8	3/4	*	130	97.334.1						
100	8	7/8	*	150	97.406.1						
150	12	1	*	170	97.474.1						
200	12	1 1/8	*	190	97.535.1						
250	16	1 1/4	*	220	97.597.1						
300	20	1 1/4	*	220	97.597.1						
350	20	1 3/8	*	240	97.646.1						
400	20	1 1/2	*	250	97.688.1						
450	20	1 5/8	*	280	97.722.1						
500	24	1 5/8	*	290	97.724.1						
600	24	1 7/8	*	330	97.786.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
						15	4	1/2	*	90	97.159.1
						20	4	5/8	*	100	97.273.1
						25	4	5/8	*	100	97.273.1
						40	4	3/4	*	120	97.332.1
50	8	5/8	*	150	97.281.1	50	8	5/8	*	120	97.276.1
80	8	3/4	*	150	97.337.1	80	8	3/4	*	150	97.337.1
100	8	7/8	*	160	97.407.1	100	8	7/8	*	170	97.409.1
150	12	1	*	180	97.475.1	150	12	1	*	210	97.480.1
200	12	1 1/8	*	210	97.538.1	200	12	1 1/8	*	230	97.541.1
250	16	1 1/4	*	230	97.598.1	250	16	1 1/4	*	260	97.603.1
300	20	1 1/4	*	240	97.600.1	300	20	1 1/4	*	270	97.605.1
350	20	1 3/8	*	260	97.649.1	350	20	1 3/8	*	290	97.654.1
400	20	1 1/2	*	280	97.693.1	400	20	1 1/2	*	310	97.698.1
450	20	1 5/8	*	300	97.725.1	450	20	1 5/8	*	340	97.732.1
500	24	1 5/8	*	320	97.728.1	500	24	1 5/8	*	360	97.736.1
600	24	1 7/8	*	360	97.791.1	600	24	1 7/8	*	420	97.802.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.403.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.97.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.404.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	4	81.38.97.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.404.1	
STUD BOLT WITH NUTS	4	81.38.97.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	2	77.24.65.403.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.97.157.1	
WELDING NECK FLANGE	2	76.64.79.336.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.403.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.97.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.65.403.1	
LAP-JOINT FLANGE	1	76.64.20.108.1	
STUD BOLT WITH NUTS	4	81.38.97.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.65.103.1	
LAP-JOINT FLANGE	2	76.64.20.108.1	
STUD BOLT WITH NUTS	8	81.38.97.157.1	
	8	81.38.97.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.985.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.97.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.985.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.97.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.208.1	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.65.403.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.97.157.1	
WELDING NECK FLANGE	1	76.64.79.336.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.65.404.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	4	81.38.97.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.212.1	
GASKET, SPIRAL WOUND	1	85.41.46.106.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.65.404.1	
STUD BOLT WITH NUTS	4	81.38.97.271.1	
WELDING NECK FLANGE	1	76.64.79.338.1	

CLASS 63011

DESIGN LIMITS									
	TEMPERATURE IN DEGREES CELSIUS								
	0	50	100	150	200	250	300	350	400

	PRESSURE BAR GA								
DN15 -200	92.5	92.5	88.1	81.9	76.6	71.9	68.2	65.4	63.0
DN250-300	81.2	81.2	81.2	81.2	76.6	71.9	68.2	65.4	63.0

- NOTES
- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL
(AMBIENT TO FLUID) 265 DEG. C.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES											
RUN SIZE	BRANCH SIZE										
	15	20	25	40	50	80	100	150	200	250	300

300	C	C	C	C	E	E	E	E	E	E	A
250	C	C	C	C	E	E	E	E	E	E	A
200	C	C	C	C	E	E	E	E	E	A	
150	C	C	C	C	E	E	E	E	A		
100	C	C	C	C	E	E	E	A			
80	C	C	C	C	E	E	A				
50	C	C	C	B	A						
40	C	B	B	A							
25	B	B	A								
20	B	A									
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE

15	40S
20	40S
25	40S
40	40S
50	40S
80	40S
100	40S
150	40S
200	40S
250	80S
300	80S

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 321/347	PLANT :	
CLASS NO. : 63011	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 63011, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321/347

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F321/347
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP321/347
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP321/347
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F321/347

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP321/347
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321/347
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321/347
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F321/347
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP321/347
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP321/347
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP321/347

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321/347
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: AISI 321/347 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 321/347
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F321/347
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE										
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE												
PIPE	74.36.15	018.1	026.1	034.1	050.1	058.1	066.1	074.1	083.1	094.1	110.1	122.1
* FLANGES												
BLIND FLANGE	76.65.10	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1
SPECTACLE BLIND FLANGE	76.88.09	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	808.1	812.1	816.1	818.1	820.1	822.1	824.1	826.1	828.1	830.1	832.1
WELDING NECK FLANGE	76.65.80	282.1	284.1	286.1	288.1	290.1	292.1	294.1	296.1	298.1	358.1	359.1
* FITTINGS												
CAP BUTT-WELD.END	76.33.18	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	159.1	175.1	191.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.38	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	159.1	175.1	191.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.39	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	659.1	675.1	691.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	159.1	175.1	191.1
* VALVES												
CHECK VALVE FLANGED	77.13.20	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1
GATE VALVE FLANGED	77.23.20	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1
GLOBE VALVE FLANGED	77.33.20	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1			
* MISCELLANEOUS												
GASKET, SPIRAL WOUND	85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1
METER RUN	76.65.96	822.1	824.1	826.1	828.1							
ORIFICE FLANGE SET	76.65.95					290.1	292.1	294.1	296.1	298.1	355.1	357.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.69.066.1	33.71.066.1	33.85.018.1
25* 15		33.69.076.1	33.71.076.1	33.85.028.1
25* 20		33.69.086.1	33.71.086.1	33.85.038.1
40* 15		33.69.096.1	33.71.096.1	33.85.042.1
40* 20		33.69.116.1	33.71.116.1	33.85.048.1
40* 25		33.69.126.1	33.71.126.1	33.85.058.1
50* 20		33.69.130.1	33.71.130.1	
50* 25		33.69.136.1	33.71.136.1	
50* 40		33.69.146.1	33.71.146.1	33.85.084.1
80* 40		33.69.176.1	33.71.176.1	
80* 50	79.73.634.1	33.69.186.1	33.71.186.1	
100* 40		33.69.192.1	33.71.192.1	
100* 50	79.73.636.1	33.69.206.1	33.71.206.1	
100* 80	79.73.660.1	33.69.216.1	33.71.216.1	
150* 50	79.73.638.1			
150* 80	79.73.662.1	33.69.247.1	33.71.247.1	
150*100	79.73.684.1	33.69.257.1	33.71.257.1	
200* 50	79.73.640.1			
200* 80	79.73.664.1			
200*100	79.73.686.1	33.69.267.1	33.71.267.1	
200*150	79.73.706.1	33.69.279.1	33.71.279.1	
250* 50	79.74.188.1			
250* 80	79.74.218.1			
250*100	79.74.220.1	33.69.286.1	33.71.286.1	
250*150	79.74.234.1	33.69.294.1	33.71.294.1	
250*200	79.74.242.1	33.69.310.1	33.71.310.1	
300* 50	79.74.190.1			
300* 80	79.74.212.1			
300*100	79.74.222.1			
300*150	79.74.236.1	33.69.320.1	33.71.320.1	
300*200	79.74.244.1	33.69.335.1	33.71.335.1	
300*250	79.74.470.1	33.69.344.1	33.71.344.1	

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-150	581.1	476.1
	200-300	582.1	477.1
20	40- 80	583.1	478.1
	100-300	584.1	479.1
25	40- 40	585.1	480.1
	50- 50	586.1	481.1
	80-100	587.1	482.1
	150-300	588.1	483.1
40	50- 50	590.1	484.1
	80- 80	591.1	485.1
	100-100	592.1	486.1
	150-300	593.1	487.1

LEVEL	GAUGE	REFLEX
LENGTH	MESCNUMBER	
-----	-----	
450	76.81.70.672.1	
840	76.81.70.674.1	
1230	76.81.70.676.1	

LEVEL	DISPLACER	CHAMBER
LENGTH	MESCNUMBER	
-----	-----	
356	76.80.61.882.1	230 76.83.37.101.1
813	76.80.61.884.1	255 76.83.37.102.1
1219	76.80.61.886.1	305 76.83.37.103.1
1524	76.80.61.888.1	355 76.83.37.105.1
1829	76.80.61.890.1	405 76.83.37.106.1
2134	76.80.61.892.1	455 76.83.37.107.1
2438	76.80.61.894.1	
2743	76.80.61.896.1	
3048	76.80.61.898.1	

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
15	4	1/2	*	80	61.157.1	15	4	1/2	*	80	61.157.1
20	4	5/8	*	90	61.271.1	20	4	5/8	*	90	61.271.1
25	4	5/8	*	90	61.271.1	25	4	5/8	*	90	61.271.1
40	4	3/4	*	110	61.330.1	40	4	3/4	*	110	61.330.1
50	8	5/8	*	110	61.274.1						
80	8	3/4	*	130	61.334.1						
100	8	7/8	*	150	61.406.1						
150	12	1	*	170	61.474.1						
200	12	1 1/8	*	190	61.535.1						
250	16	1 1/4	*	220	61.597.1						
300	20	1 1/4	*	220	61.597.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
						15	4	1/2	*	90	61.159.1
						20	4	5/8	*	100	61.273.1
						25	4	5/8	*	100	61.273.1
						40	4	3/4	*	120	61.332.1
50	8	5/8	*	150	61.281.1	50	8	5/8	*	120	61.276.1
80	8	3/4	*	150	61.337.1	80	8	3/4	*	150	61.337.1
100	8	7/8	*	160	61.407.1	100	8	7/8	*	170	61.409.1
150	12	1	*	180	61.475.1	150	12	1	*	210	61.480.1
200	12	1 1/8	*	210	61.538.1	200	12	1 1/8	*	230	61.541.1
250	16	1 1/4	*	230	61.598.1	250	16	1 1/4	*	260	61.603.1
300	20	1 1/4	*	240	61.600.1	300	20	1 1/4	*	270	61.605.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.162.1
GASKET, SPIRAL WOUND 2 85.41.46.104.1
GATE VALVE FLANGED 1 77.23.20.103.1
STUD BOLT WITH NUTS 8 81.38.61.157.1
WELDING NECK FLANGE 1 76.65.80.282.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.164.1
GASKET, SPIRAL WOUND 2 85.41.46.106.1
GATE VALVE FLANGED 1 77.23.20.104.1
STUD BOLT WITH NUTS 8 81.38.61.271.1
WELDING NECK FLANGE 1 76.65.80.284.1

* DRAIN POINT DN 20 FIG.0H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.164.1
GASKET, SPIRAL WOUND 2 85.41.46.106.1
GATE VALVE FLANGED 1 77.23.20.104.1
STUD BOLT WITH NUTS 8 81.38.61.271.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.104.1
GATE VALVE FLANGED 2 77.23.20.103.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.157.1
8 81.38.61.157.1
WELDING NECK FLANGE 2 76.65.80.282.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.104.1
GATE VALVE FLANGED 1 77.23.20.103.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.157.1
4 81.38.61.157.1
WELDING NECK FLANGE 1 76.65.80.282.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.104.1
GATE VALVE FLANGED 1 77.23.20.103.1
LAP-JOINT FLANGE 1 76.62.20.308.1
STUD BOLT WITH NUTS 4 81.38.61.157.1
4 81.38.61.157.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.104.1
GATE VALVE FLANGED 2 77.23.20.103.1
LAP-JOINT FLANGE 2 76.62.20.308.1
STUD BOLT WITH NUTS 8 81.38.61.157.1
8 81.38.61.157.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.535.1
GASKET, SPIRAL WOUND 1 85.41.46.112.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.535.1
GASKET, SPIRAL WOUND 1 85.41.46.112.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.162.1
GASKET, SPIRAL WOUND 2 85.41.46.104.1
GLOBE VALVE FLANGED 1 77.33.20.103.1
STUD BOLT WITH NUTS 8 81.38.61.157.1
WELDING NECK FLANGE 1 76.65.80.282.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.164.1
GASKET, SPIRAL WOUND 2 85.41.46.106.1
GLOBE VALVE FLANGED 1 77.33.20.104.1
STUD BOLT WITH NUTS 8 81.38.61.271.1
WELDING NECK FLANGE 1 76.65.80.284.1

* VENT POINT DN 20 FIG.1H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.164.1
GASKET, SPIRAL WOUND 2 85.41.46.106.1
GLOBE VALVE FLANGED 1 77.33.20.104.1
STUD BOLT WITH NUTS 8 81.38.61.271.1

CLASS 63021

DESIGN LIMITS									
TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400
PRESSURE BAR GA									
DN15 -200	99.2	96.2	84.5	77.0	71.1	66.7	63.1	61.0	58.9

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
- FOR LEVEL GAUGES, RECOMMENDED MAX. TEMPERATURE DIFFERENTIAL (AMBIENT TO FLUID) 265 DEG. C.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES									
BRANCHSIZE									
RUN SIZE	20		40		80		150		
	15	25	50	100	200				
200	C	C	C	C	E	E	E	E	A
150	C	C	C	C	E	E	E	A	
100	C	C	C	C	E	E	A		
80	C	C	C	C	E	A			
50	C	C	C	B	A				
40	C	B	B	A					
25	B	B	A						
20	B	A							
15	A								

TABLE OF SCHEDULES	
DN	SCHEDULE
15	40S
20	40S
25	40S
40	40S
50	40S
80	40S
100	40S
150	80S
200	80S

CODE	EXPLANATION OF CHARACTERS
----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			
STAINL STEEL AISI 316	PLANT	:	
CLASS NO. : 63021	CONSIGNEE	:	
ANS RATING : CLASS 600	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	
ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 63021, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-200	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-200	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-200	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-200	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-200	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A403-WP316L

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L) ,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L) ,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L) ,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-200	AISI 316 (L) ,GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP316
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7/A194-2H
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWGS	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 63021, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE								
			15	20	25	40	50	80	100	150	200

* PIPE											
PIPE		74.36.33	018.1	026.1	034.1	050.1	058.1	066.1	074.1	085.1	097.1
PIPE NIPPLE	50MM	76.33.57	931.1	941.1	951.1	971.1					
* FLANGES											
BLIND FLANGE		76.65.10	462.1	464.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1
SPECTACLE BLIND FLANGE		76.88.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1
WELDING NECK FLANGE		76.65.80	482.1	484.1	486.1	488.1	490.1	492.1	494.1	556.1	558.1
* FITTINGS											
CAP BUTT-WELD.END		76.33.19	286.1	296.1	306.1	326.1	336.1	356.1	376.1	397.1	411.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	286.1	296.1	306.1	326.1	336.1	356.1	376.1	397.1	411.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	286.1	296.1	306.1	326.1	336.1	356.1	376.1	397.1	411.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	786.1	796.1	806.1	826.1	836.1	856.1	876.1	897.1	911.1
* VALVES											
CHECK VALVE FLANGED		77.13.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1
GATE VALVE FLANGED		77.23.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1
GLOBE VALVE FLANGED		77.33.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	
* MISCELLANEOUS											
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1
METER RUN		76.65.96	422.1	424.1	426.1	428.1					
ORIFICE FLANGE SET		76.65.92					490.1	492.1	494.1	556.1	558.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.566.1	33.72.566.1	33.85.618.1
25* 15		33.70.576.1	33.72.576.1	33.85.628.1
25* 20		33.70.586.1	33.72.586.1	33.85.638.1
40* 15		33.70.596.1	33.72.596.1	33.85.642.1
40* 20		33.70.616.1	33.72.616.1	33.85.648.1
40* 25		33.70.626.1	33.72.626.1	33.85.658.1
50* 20		36.50.094.1	36.63.094.1	33.85.664.1
50* 25		33.70.636.1	33.72.636.1	33.85.674.1
50* 40		33.70.646.1	33.72.646.1	33.85.684.1
80* 40		33.70.676.1	33.72.676.1	33.85.694.1
80* 50	79.69.634.1	33.70.686.1	33.72.686.1	33.89.354.1
100* 40		33.70.694.1	33.72.694.1	33.89.362.1
100* 50	79.69.636.1	33.70.706.1	33.72.706.1	33.89.370.1
100* 80	79.69.660.1	33.70.716.1	33.72.716.1	33.89.378.1
150* 50	79.70.184.1			
150* 80	79.70.206.1	33.70.746.1	33.72.746.1	33.89.387.1
150*100	79.70.220.1	33.70.756.1	33.72.756.1	33.89.395.1
200* 50	79.70.186.1			
200* 80	79.70.208.1			
200*100	79.70.222.1	33.70.768.1	33.72.768.1	33.89.403.1
200*150	79.70.432.1	33.70.781.1	33.72.781.1	33.89.412.1

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE		
15	40-150	081.1	451.1
	200-200	082.1	452.1
20	40- 80	083.1	453.1
	100-200	084.1	454.1
25	40- 40	085.1	455.1
	50- 50	086.1	456.1
	80-100	087.1	457.1
	150-200	088.1	458.1
40	50- 50	090.1	459.1
	80- 80	091.1	460.1
	100-100	092.1	461.1
	150-200	093.1	462.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCSNUMBER	LENGTH MESCSNUMBER
450	76.81.70.072.1
840	76.81.70.074.1
1230	76.81.70.076.1
450	76.81.70.572.1
840	76.81.70.574.1
1230	76.81.70.576.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCSNUMBER	LENGTH MESCSNUMBER
356	76.80.61.482.1
813	76.80.61.484.1
1219	76.80.61.486.1
1524	76.80.61.488.1
1829	76.80.61.490.1
2134	76.80.61.492.1
2438	76.80.61.494.1
2743	76.80.61.496.1
3048	76.80.61.498.1
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	80	15	4	1/2	*	80
20	4	5/8	*	90	20	4	5/8	*	90
25	4	5/8	*	90	25	4	5/8	*	90
40	4	3/4	*	110	40	4	3/4	*	110
50	8	5/8	*	110					
80	8	3/4	*	130					
100	8	7/8	*	150					
150	12	1	*	170					
200	12	1 1/8	*	190					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.462.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.03.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.65.80.482.1	

* DRAIN POINT	DN 20	FIG.0I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.464.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.23.03.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	
WELDING NECK FLANGE	1	76.65.80.484.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.464.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.23.03.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -200
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.03.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	
WELDING NECK FLANGE	2	76.65.80.482.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.03.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	
WELDING NECK FLANGE	1	76.65.80.482.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.03.103.1	
LAP-JOINT FLANGE	1	76.62.20.308.1	
STUD BOLT WITH NUTS	4	81.38.61.157.1	
	4	81.38.61.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.03.103.1	
LAP-JOINT FLANGE	2	76.62.20.308.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
	8	81.38.61.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.535.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.462.1	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.33.03.103.1	
STUD BOLT WITH NUTS	8	81.38.61.157.1	
WELDING NECK FLANGE	1	76.65.80.482.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.464.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.33.03.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	
WELDING NECK FLANGE	1	76.65.80.484.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.464.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.33.03.104.1	
STUD BOLT WITH NUTS	8	81.38.61.271.1	

CLASS 63050

DESIGN LIMITS										
	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -150	99.2	97.0	88.1	81.9	76.6	71.9	68.2	65.4	63.0	61.7
DN200-200	92.5	92.5	88.1	81.9	76.6	71.9	68.2	65.4	63.0	61.7
DN250-250	83.9	83.9	83.9	81.9	76.6	71.9	68.2	65.4	63.0	61.7
DN300-300	72.5	72.5	72.5	72.5	72.5	70.4	67.3	64.5	62.2	60.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES												
RUN SIZE	BRANCHSIZE											
	15	20	25	40	50	80	100	150	200	250	300	

300	C	C	C	C	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	A			
150	C	C	C	C	E	E	E	A				
100	C	C	C	C	E	E	A					
80	C	C	C	C	E	A						
50	C	C	C	B	A							
40	C	B	B	A								
25	B	B	A									
20	B	A										
15	A											

TABLE OF SCHEDULES	
DN	SCHEDULE

15	40S
20	40S
25	40S
40	40S
50	40S
80	40S
100	40S
150	40S
200	40S
250	40S
300	40S

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.		

STAINL STEEL AISI 321/347	PLANT :	
CLASS NO. : 63050	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999		

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321/347

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F321/347
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F321/347
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F321/347
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP321/347
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP321/347
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F321/347

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP321/347
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP321/347

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321/347
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321/347
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F321/347
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP321/347
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP321/347
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP321/347

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321/347
MTRR	METER RUN	DN 15- 40	AISI 321/347
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F321/347
STBT	STUD BOLT WITH NUTS	---	ASTM A453-GR.660 CLASS A
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE										
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE												
PIPE	74.36.15	018.1	026.1	034.1	050.1	058.1	066.1	074.1	083.1	094.1	106.1	118.1
* FLANGES												
BLIND FLANGE	76.65.10	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1
SPECTACLE BLIND FLANGE	76.88.09	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	808.1	812.1	816.1	818.1	820.1	822.1	824.1	826.1	828.1	830.1	832.1
WELDING NECK FLANGE	76.65.80	282.1	284.1	286.1	288.1	290.1	292.1	294.1	296.1	298.1	300.1	302.1
* FITTINGS												
CAP BUTT-WELD.END	76.33.18	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	159.1	171.1	188.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.38	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	159.1	171.1	188.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.39	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	659.1	671.1	688.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	159.1	171.1	188.1
* VALVES												
CHECK VALVE FLANGED	77.13.20	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1
GATE VALVE FLANGED	77.23.20	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1
GLOBE VALVE FLANGED	77.33.20	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1			
* MISCELLANEOUS												
GASKET, SPIRAL WOUND	85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1
METER RUN	76.65.96	822.1	824.1	826.1	828.1							
ORIFICE FLANGE SET	76.65.95					290.1	292.1	294.1	296.1	298.1	300.1	302.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.69.066.1	33.71.066.1	33.85.018.1
25* 15		33.69.076.1	33.71.076.1	33.85.028.1
25* 20		33.69.086.1	33.71.086.1	33.85.038.1
40* 15		33.69.096.1	33.71.096.1	33.85.042.1
40* 20		33.69.116.1	33.71.116.1	33.85.048.1
40* 25		33.69.126.1	33.71.126.1	33.85.058.1
50* 20		33.69.130.1	33.71.130.1	
50* 25		33.69.136.1	33.71.136.1	
50* 40		33.69.146.1	33.71.146.1	33.85.084.1
80* 40		33.69.176.1	33.71.176.1	
80* 50	79.73.634.1	33.69.186.1	33.71.186.1	
100* 40		33.69.192.1	33.71.192.1	
100* 50	79.73.636.1	33.69.206.1	33.71.206.1	
100* 80	79.73.660.1	33.69.216.1	33.71.216.1	
150* 50	79.73.638.1			
150* 80	79.73.662.1	33.69.247.1	33.71.247.1	
150*100	79.73.684.1	33.69.257.1	33.71.257.1	
200* 50	79.73.640.1			
200* 80	79.73.664.1			
200*100	79.73.686.1	33.69.267.1	33.71.267.1	
200*150	79.73.706.1	33.69.279.1	33.71.279.1	
250* 50	79.73.642.1			
250* 80	79.73.666.1			
250*100	79.73.688.1	33.69.285.1	33.71.285.1	
250*150	79.73.708.1	33.69.293.1	33.71.293.1	
250*200	79.73.726.1	33.69.309.1	33.71.309.1	
300* 50	79.73.644.1			
300* 80	79.73.668.1			
300*100	79.73.690.1			
300*150	79.73.710.1	33.69.321.1	33.71.321.1	
300*200	79.73.728.1	33.69.330.1	33.71.330.1	
300*250	79.73.744.1	33.69.342.1	33.71.342.1	

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-150	581.1	476.1
	200-300	582.1	477.1
20	40- 80	583.1	478.1
	100-300	584.1	479.1
25	40- 40	585.1	480.1
	50- 50	586.1	481.1
	80-100	587.1	482.1
	150-300	588.1	483.1
40	50- 50	590.1	484.1
	80- 80	591.1	485.1
	100-100	592.1	486.1
	150-300	593.1	487.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
356	76.80.61.882.1		230	76.83.37.101.1
813	76.80.61.884.1		255	76.83.37.102.1
1219	76.80.61.886.1		305	76.83.37.103.1
1524	76.80.61.888.1		355	76.83.37.105.1
1829	76.80.61.890.1		405	76.83.37.106.1
2134	76.80.61.892.1		455	76.83.37.107.1
2438	76.80.61.894.1			
2743	76.80.61.896.1			
3048	76.80.61.898.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	80	15	4	1/2	*	80
20	4	5/8	*	90	20	4	5/8	*	90
25	4	5/8	*	90	25	4	5/8	*	90
40	4	3/4	*	110	40	4	3/4	*	110
50	8	5/8	*	110					
80	8	3/4	*	130					
100	8	7/8	*	150					
150	12	1	*	170					
200	12	1 1/8	*	190					
250	16	1 1/4	*	220					
300	20	1 1/4	*	220					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230
250	16	1 1/4	*	230	250	16	1 1/4	*	260
300	20	1 1/4	*	240	300	20	1 1/4	*	270

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.162.1
GASKET, SPIRAL WOUND 2 85.41.46.104.1
GATE VALVE FLANGED 1 77.23.20.103.1
STUD BOLT WITH NUTS 8 81.38.74.157.1
WELDING NECK FLANGE 1 76.65.80.282.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.164.1
GASKET, SPIRAL WOUND 2 85.41.46.106.1
GATE VALVE FLANGED 1 77.23.20.104.1
STUD BOLT WITH NUTS 8 81.38.74.271.1
WELDING NECK FLANGE 1 76.65.80.284.1

* DRAIN POINT DN 20 FIG.0H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.164.1
GASKET, SPIRAL WOUND 2 85.41.46.106.1
GATE VALVE FLANGED 1 77.23.20.104.1
STUD BOLT WITH NUTS 8 81.38.74.271.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.104.1
GATE VALVE FLANGED 2 77.23.20.103.1
LAP-JOINT FLANGE 2 76.65.20.108.1
STUD BOLT WITH NUTS 8 81.38.74.157.1
WELDING NECK FLANGE 2 76.65.80.282.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.104.1
GATE VALVE FLANGED 1 77.23.20.103.1
LAP-JOINT FLANGE 1 76.65.20.108.1
STUD BOLT WITH NUTS 4 81.38.74.157.1
WELDING NECK FLANGE 4 81.38.74.157.1
WELDING NECK FLANGE 1 76.65.80.282.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.104.1
GATE VALVE FLANGED 1 77.23.20.103.1
LAP-JOINT FLANGE 1 76.65.20.108.1
STUD BOLT WITH NUTS 4 81.38.74.157.1
WELDING NECK FLANGE 4 81.38.74.157.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.104.1
GATE VALVE FLANGED 2 77.23.20.103.1
LAP-JOINT FLANGE 2 76.65.20.108.1
STUD BOLT WITH NUTS 8 81.38.74.157.1
WELDING NECK FLANGE 8 81.38.74.157.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.65.60.685.1
GASKET, SPIRAL WOUND 1 85.41.46.112.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.65.60.685.1
GASKET, SPIRAL WOUND 1 85.41.46.112.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.162.1
GASKET, SPIRAL WOUND 2 85.41.46.104.1
GLOBE VALVE FLANGED 1 77.33.20.103.1
STUD BOLT WITH NUTS 8 81.38.74.157.1
WELDING NECK FLANGE 1 76.65.80.282.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.164.1
GASKET, SPIRAL WOUND 2 85.41.46.106.1
GLOBE VALVE FLANGED 1 77.33.20.104.1
STUD BOLT WITH NUTS 8 81.38.74.271.1
WELDING NECK FLANGE 1 76.65.80.284.1

* VENT POINT DN 20 FIG.1H DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.10.164.1
GASKET, SPIRAL WOUND 2 85.41.46.106.1
GLOBE VALVE FLANGED 1 77.33.20.104.1
STUD BOLT WITH NUTS 8 81.38.74.271.1

CLASS 63055

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	450	500	538
	PRESSURE BAR GA										
DN15 -200	99.2	97.0	88.1	81.9	76.6	71.9	68.2	65.4	61.7	56.1	49.2
DN250-250	96.8	96.8	88.1	81.9	76.6	71.9	68.2	65.4	61.7	56.1	49.2
DN300-450	81.2	81.2	81.2	81.2	76.6	71.9	68.2	65.4	61.7	56.1	49.2
DN500-600	79.5	79.5	79.5	79.5	76.6	71.9	68.2	65.4	61.7	56.1	49.2

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT
RECOMMENDED.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE																DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600		
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	15	40S
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	40S
450	C	C	C	C	E	E	E	E	E	B	B	B	B	B	A		25	40S
400	C	C	C	C	E	E	E	E	E	B	B	B	B	A			40	40S
350	C	C	C	C	E	E	E	E	E	B	B	B	A				50	40S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	40S
250	C	C	C	C	E	E	E	E	B	B	A						100	40S
200	C	C	C	C	E	E	B	B	A								150	40S
150	C	C	C	C	E	B	B	A									200	80S
100	C	C	C	C	B	B	A										250	80S
80	C	C	C	B	B	A											300	80S
50	C	C	C	B	A												350	40
40	C	B	B	A													400	40
25	B	B	A														450	40
20	B	A															500	40
15	A																600	40

TABLE OF SCHEDULES

DN	SCHEDULE
15	40S
20	40S
25	40S
40	40S
50	40S
80	40S
100	40S
150	40S
200	80S
250	80S
300	80S
350	40
400	40
450	40
500	40
600	40

CODE EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 321 STAB HT	PLANT :	
CLASS NO. : 63055	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321 STAB HT
		DN350-600	ASTM A358-321 STAB HT
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP321 STAB HT

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F321 STAB HT
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F321/347
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F321/347
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240-TP321 STAB HT
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240-TP321 STAB HT
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F321 STAB HT

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A403-WP-S-321 STAB HT
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321 STAB HT
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321 STAB HT
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F321 STAB HT
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A403-WP-S-321 STAB HT
		DN 40-600	ASTM A403-WP-S/W-321 STAB HT
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-600	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321 STAB HT
MTRR	METER RUN	DN 15- 40	AISI 321 STAB HT
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F321 STAB HT
STBT	STUD BOLT WITH NUTS	---	ASTM A453-GR.660 CLASS A

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.36.19	018.1	026.1	034.1	050.1	058.1	066.1	074.1	083.1	095.1	110.1	122.1					
		74.36.21												128.1	138.1	148.1	158.1	179.1
PIPE NIPPLE 50MM		76.33.57	031.1	041.1	051.1	071.1												
* FLANGES																		
BLIND FLANGE		76.65.08	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1					
SPECTACLE BLIND FLANGE		76.88.10	904.1	906.1	908.1	910.1	912.1	914.1	916.1	918.1	920.1	922.1	924.1	926.1	928.1	930.1	932.1	934.1
SPACER RING TYPE (ASME FLANGE)		76.88.15	042.1	044.1	046.1	048.1	050.1	052.1	054.1	056.1	058.1	060.1	062.1	064.1	066.1	068.1	070.1	072.1
WELDING NECK FLANGE		76.65.77	252.1	254.1	256.1	258.1	260.1	262.1	264.1	266.1	286.1	288.1	290.1	274.1	276.1	278.1	280.1	282.1
* FITTINGS																		
CAP BUTT-WELD.END		76.33.21	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	161.1	175.1	191.1	201.1	211.1	222.1	233.1	253.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	661.1	675.1	691.1	698.1	708.1	718.1	733.1	748.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.39	786.1	796.1	806.1	826.1	836.1	856.1	876.1	896.1	911.1	925.1	941.1	948.1	958.1	973.1	983.1	993.1
EQUAL TEE BUTT-WELD ENDS		76.33.83	786.1	796.1	806.1	826.1	836.1	856.1	876.1	896.1	911.1	925.1	941.1	949.1	960.1	969.1	980.1	991.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.14.24	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE BUTT-WELD ENDS		77.24.24	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.23.24	103.1	104.1	105.1	107.1	108.1											
GLOBE VALVE BUTT-WELD ENDS		77.34.24	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	404.1	406.1	408.1	412.1	414.1	418.1	420.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	438.1	442.1
METER RUN		76.65.97	122.1	124.1	126.1	128.1												
ORIFICE FLANGE SET		76.65.95					776.1	778.1	816.1	818.1	834.1	836.1	838.1	864.1	866.1	868.1	870.1	872.1

RUN* BR	BROB	RECB	REEB	TERB									BNIF	BNIP
	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.80.40	76.80.31
BR	-----													
20* 15		33.68.566.1	33.74.066.1	33.88.018.1	400* 50	79.57.842.1							15	40-150 761.1 386.1
25* 15		33.68.576.1	33.74.076.1	33.88.028.1	400* 80	79.57.856.1								200-600 762.1 387.1
25* 20		33.68.586.1	33.74.086.1	33.88.038.1	400*100	79.57.867.1							20	40- 80 763.1 388.1
40* 15		33.68.596.1	33.74.096.1	33.88.042.1	400*150	79.57.877.1	36.49.630.1	36.64.630.1	33.88.584.1					100-600 764.1 389.1
40* 20		33.68.616.1	33.74.116.1	33.88.048.1	400*200	79.59.091.1	33.68.939.1	33.74.494.1	33.88.599.1				25	40- 40 765.1 390.1
40* 25		33.68.626.1	33.74.126.1	33.88.058.1	400*250	79.59.097.1	33.68.954.1	33.74.524.1	33.88.619.1					50- 50 766.1 391.1
50* 20		36.49.103.1	36.64.103.1		400*300	79.59.102.1	33.68.967.1	33.74.550.1	33.88.639.1					80-100 767.1 392.1
50* 25		33.68.636.1	33.74.136.1		400*350	79.57.912.1	33.68.987.1	33.74.580.1	33.88.658.1					150-600 768.1 393.1
50* 40		33.68.646.1	33.74.146.1	33.88.084.1	450* 50	79.57.843.1							40	50- 50 770.1 394.1
80* 40		33.68.676.1	33.74.176.1	33.88.094.1	450* 80	79.57.857.1								80- 80 771.1 395.1
80* 50	79.57.634.1	33.68.686.1	33.74.186.1	33.88.104.1	450*100	79.57.868.1								100-100 772.1 396.1
100* 40		36.49.187.1	36.64.187.1		450*150	79.57.878.1								150-300 773.1 397.1
100* 50	79.57.636.1	33.68.706.1	33.74.206.1	33.88.200.1	450*200	79.59.092.1	36.49.730.1	36.64.730.1	33.88.679.1					350-600 774.1 398.1
100* 80	79.57.660.1	33.68.716.1	33.74.216.1	33.88.228.1	450*250	79.59.098.1	33.63.013.1	33.74.614.1	33.88.694.1					
150* 50	79.57.638.1				450*300	79.59.103.1	33.63.043.1	33.74.643.1	33.88.714.1					
150* 80	79.57.662.1	33.68.747.1	33.74.247.1	33.88.256.1	450*350	79.57.913.1	33.63.073.1	33.74.673.1	33.88.733.1					
150*100	79.57.684.1	33.68.757.1	33.74.257.1	33.88.284.1	450*400	79.57.916.1	33.63.103.1	33.74.703.1	33.88.753.1					
200* 50	79.58.186.1				500* 50	79.57.844.1								
200* 80	79.58.208.1				500* 80	79.57.858.1								
200*100	79.58.222.1	33.68.768.1	33.74.268.1	33.88.313.1	500*100	79.57.869.1								
200*150	79.58.232.1	33.68.780.1	33.74.280.1	33.88.341.1	500*150	79.57.879.1								
250* 50	79.58.188.1				500*200	79.59.093.1	36.49.796.1	36.64.796.1	33.88.774.1				LEVEL	DISPLACER CHAMBER
250* 80	79.58.210.1				500*250	79.59.099.1	36.49.815.1	36.64.815.1	33.88.789.1				LENGTH	MESCNUMBER
250*100	79.58.224.1	36.49.339.1	36.64.339.1	33.88.370.1	500*300	79.59.104.1	33.63.133.1	33.74.734.1	33.88.809.1				-----	-----
250*150	79.58.234.1	33.68.799.1	33.74.299.1	33.88.395.1	500*350	79.57.914.1	33.63.163.1	33.74.763.1	33.88.828.1				356	76.80.61.642.1
250*200	79.58.452.1	33.68.811.1	33.74.311.1	33.88.419.1	500*400	79.57.917.1	33.63.193.1	33.74.793.1	33.88.847.1				813	76.80.61.644.1
300* 50	79.58.190.1				500*450	79.57.919.1	33.63.223.1	33.74.823.1	33.88.867.1				1219	76.80.61.646.1
300* 80	79.58.212.1				600* 50	79.57.846.1							1524	76.80.61.648.1
300*100	79.58.226.1				600* 80	79.57.860.1							1829	76.80.61.650.1
300*150	79.58.236.1	33.68.820.1	33.74.320.1	33.88.446.1	600*100	79.57.871.1							2134	76.80.61.652.1
300*200	79.58.454.1	33.68.833.1	33.74.333.1	33.88.471.1	600*150	79.57.881.1							2438	76.80.61.654.1
300*250	79.58.470.1	33.68.844.1	33.74.344.1	33.88.487.1	600*200	79.59.094.1							2743	76.80.61.656.1
350* 50	79.57.841.1				600*250	79.59.100.1	36.49.895.1	36.64.895.1	33.88.889.1				3048	76.80.61.658.1
350* 80	79.57.855.1				600*300	79.59.105.1	36.49.915.1	36.64.915.1	33.88.904.1					
350*100	79.57.866.1				600*350	79.57.915.1	36.49.924.1	36.64.924.1	33.88.923.1					
350*150	79.57.876.1	36.49.513.1	36.64.513.1	33.88.504.1	600*400	79.57.918.1	33.63.253.1	33.74.853.1	33.88.942.1					
350*200	79.59.090.1	33.68.870.1	33.74.397.1	33.88.524.1	600*450	79.57.920.1	33.63.283.1	33.74.883.1	33.88.963.1					
350*250	79.59.096.1	33.68.897.1	33.74.427.1	33.88.544.1	600*500	79.57.921.1	33.63.313.1	33.74.913.1	33.88.983.1					
350*300	79.59.101.1	33.68.917.1	33.74.457.1	33.88.564.1										

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	80	15	4	1/2	*	80
20	4	5/8	*	90	20	4	5/8	*	90
25	4	5/8	*	90	25	4	5/8	*	90
40	4	3/4	*	110	40	4	3/4	*	110
50	8	5/8	*	110					
80	8	3/4	*	130					
100	8	7/8	*	150					
150	12	1	*	170					
200	12	1 1/8	*	190					
250	16	1 1/4	*	220					
300	20	1 1/4	*	220					
350	20	1 3/8	*	240					
400	20	1 1/2	*	250					
450	20	1 5/8	*	280					
500	24	1 5/8	*	290					
600	24	1 7/8	*	330					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	1/2	*	90
					20	4	5/8	*	100
					25	4	5/8	*	100
					40	4	3/4	*	120
50	8	5/8	*	150	50	8	5/8	*	120
80	8	3/4	*	150	80	8	3/4	*	150
100	8	7/8	*	160	100	8	7/8	*	170
150	12	1	*	180	150	12	1	*	210
200	12	1 1/8	*	210	200	12	1 1/8	*	230
250	16	1 1/4	*	230	250	16	1 1/4	*	260
300	20	1 1/4	*	240	300	20	1 1/4	*	270
350	20	1 3/8	*	260	350	20	1 3/8	*	290
400	20	1 1/2	*	280	400	20	1 1/2	*	310
450	20	1 5/8	*	300	450	20	1 5/8	*	340
500	24	1 5/8	*	320	500	24	1 5/8	*	360
600	24	1 7/8	*	360	600	24	1 7/8	*	420

ASSEMBLIES

* DRAIN POINT					DN 15 FIG.0N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
BLIND FLANGE					1 76.65.08.162.1				
GASKET, SPIRAL WOUND					1 85.41.46.404.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.24.103.1				
PIPE NIPPLE 50MM					1 76.33.57.031.1				
STUD BOLT WITH NUTS					4 81.38.74.157.1				
WELDING NECK FLANGE					1 76.65.77.252.1				

* DRAIN POINT					DN 20 FIG.0N DN 40 - 40				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
BLIND FLANGE					1 76.65.08.164.1				
GASKET, SPIRAL WOUND					1 85.41.46.406.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.24.104.1				
PIPE NIPPLE 50MM					1 76.33.57.041.1				
STUD BOLT WITH NUTS					4 81.38.74.271.1				
WELDING NECK FLANGE					1 76.65.77.254.1				

* DRAIN POINT					DN 20 FIG.0M DN 50 -600				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
BLIND FLANGE					1 76.65.08.164.1				
GASKET, SPIRAL WOUND					1 85.41.46.406.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.24.104.1				
STUD BOLT WITH NUTS					4 81.38.74.271.1				
WELDING NECK FLANGE					1 76.65.77.254.1				

* ORIFICE INSTR.CONN.					DN 15 FIG.0M DN 50 -600				
Branch: (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
GASKET, SPIRAL WOUND					2 85.41.46.404.1				
GATE VALVE BUTT-WELD ENDS					2 77.24.24.103.1				
LAP-JOINT FLANGE					2 76.65.20.108.1				
STUD BOLT WITH NUTS					4 81.38.74.157.1				
WELDING NECK FLANGE					2 76.65.77.252.1				

* PRESSURE INSTR.CONN.					DN 15 FIG.0N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
GASKET, SPIRAL WOUND					1 85.41.46.404.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.24.103.1				
LAP-JOINT FLANGE					1 76.65.20.108.1				
PIPE NIPPLE 50MM					1 76.33.57.031.1				
STUD BOLT WITH NUTS					4 81.38.74.157.1				
WELDING NECK FLANGE					1 76.65.77.252.1				

* PRESSURE INSTR.CONN.					DN 15 FIG.0M DN 40 -600				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
GASKET, SPIRAL WOUND					1 85.41.46.404.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.24.103.1				
LAP-JOINT FLANGE					1 76.65.20.108.1				
STUD BOLT WITH NUTS					4 81.38.74.157.1				
WELDING NECK FLANGE					1 76.65.77.252.1				

* METERRUN INSTR. CONN					DN 15 FIG.0H DN 15 - 40				
Branch: (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
GASKET, SPIRAL WOUND					4 85.41.46.404.1				
GATE VALVE FLANGED					2 77.23.24.103.1				
LAP-JOINT FLANGE					2 76.65.20.108.1				
STUD BOLT WITH NUTS					8 81.38.74.157.1				
					8 81.38.74.157.1				

* TEMPERATURE INSTR.C.					DN 40 FIG.AA DN 80 -100				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
COVER FLANGE THERMOWELL NOZZLE					1 76.65.60.685.1				
GASKET, SPIRAL WOUND					1 85.41.46.412.1				
STUD BOLT WITH NUTS					4 81.38.74.334.1				

* TEMPERATURE INSTR.C.					DN 40 FIG.BB DN150 -600				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
COVER FLANGE THERMOWELL NOZZLE					1 76.65.60.685.1				
GASKET, SPIRAL WOUND					1 85.41.46.412.1				
STUD BOLT WITH NUTS					4 81.38.74.334.1				

* VENT POINT					DN 15 FIG.1N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
BLIND FLANGE					1 76.65.08.162.1				
GASKET, SPIRAL WOUND					1 85.41.46.404.1				
GLOBE VALVE BUTT-WELD ENDS					1 77.34.24.103.1				
PIPE NIPPLE 50MM					1 76.33.57.031.1				
STUD BOLT WITH NUTS					4 81.38.74.157.1				
WELDING NECK FLANGE					1 76.65.77.252.1				

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1(PIPING COMP.)		
BLIND FLANGE	1	76.65.08.164.1	
GASKET, SPIRAL WOUND	1	85.41.46.406.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.24.104.1	
PIPE NIPPLE 50MM	1	76.33.57.041.1	
STUD BOLT WITH NUTS	4	81.38.74.271.1	
WELDING NECK FLANGE	1	76.65.77.254.1	

CLASS 63090

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-200	0	50	100	125	150	

PRESSURE BAR GA						
DN15 -600	93.1	93.1	89.6	76.3	72.7	69.2

NOTES

-
- DESIGN LIMITS ACC.TO ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	15 40S
500	C	C	C	C	E	E	E	E	E	E	E	E	E	E	E	A	20 40S
450	C	C	C	C	E	E	E	E	E	E	E	E	E	E	A		25 40S
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A			40 40S
350	C	C	C	C	E	E	E	E	E	E	E	A					50 40S
300	C	C	C	C	E	E	E	E	E	E	A						80 40S
250	C	C	C	C	E	E	E	E	E	A							100 40S
200	C	C	C	C	E	E	E	E	A								150 40S
150	C	C	C	C	E	E	E	A									200 80S
100	C	C	C	C	E	E	A										250 80S
80	C	C	C	C	E	A											300 80S
50	C	C	C	B	A												350 60
40	C	B	B	A													400 60
25	B	B	A														450 60
20	B	A															500 60
15	A																600 60

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 304 LT	PLANT :	
CLASS NO. : 63090	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 63090, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP304
		DN350-600	ASTM A358-304
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP304

* FLANGES

COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F304
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F304
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240-TP304
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240-TP304
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F304

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A403-WP304
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP304
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP304
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A403-WP304

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F304
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F304
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F304
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-600	ASTM A403-WP304
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-600	ASTM A403-WP304
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A403-WP304

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-600	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	AISI 316 (L),GRAPHITE FILLED CS CENTRING RING
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F304
STBT	STUD BOLT WITH NUTS	---	BOLTDIA <= 1 1/2 INCH: ASTM A193-B8 CL.2/A194-8 BOLTDIA > 1 1/2 INCH: ASTM A193-B8M2 CL.2B/A194-8M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS
ISSUE DATE : JANUARY 1999

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		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.36.03	018.1	026.1	034.1	042.1	058.1	066.1	074.1	083.1	097.1	110.1	122.1					
		74.36.05												133.1	144.1	154.1	167.1	194.1
PIPE NIPPLE 50MM		76.33.57	631.1	641.1	651.1	671.1												
* FLANGES																		
SPECTACLE BLIND FLANGE		76.88.09	758.1	762.1	766.1	768.1	770.1	772.1	774.1	776.1	778.1	780.1	782.1	784.1	786.1	788.1	790.1	794.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	158.1	162.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	190.1	194.1
WELDING NECK FLANGE		76.65.81	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	132.1	134.1	136.1	144.1	146.1	148.1	150.1	152.1
* FITTINGS																		
CAP BUTT-WELD.END		76.33.18	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	661.1	675.1	691.1	703.1	713.1	725.1	741.1	761.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.38	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	661.1	675.1	691.1	703.1	713.1	725.1	741.1	761.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.40	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	661.1	675.1	691.1	703.1	713.1	725.1	741.1	761.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	536.1	546.1	556.1	576.1	586.1	606.1	626.1	646.1	661.1	675.1	691.1	703.1	713.1	725.1	741.1	761.1
* VALVES																		
CHECK VALVE FLANGED		77.13.08	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GATE VALVE FLANGED		77.23.08	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
GLOBE VALVE FLANGED		77.33.08	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	104.1	106.1	108.1	112.1	114.1	118.1	120.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	142.1
METER RUN		76.65.96	422.1	424.1	426.1	428.1												
ORIFICE FLANGE SET		76.65.90					090.1	092.1	094.1	096.1	140.1	142.1	144.1	122.1	124.1	126.1	128.1	130.1

		BROB	RECB	REEB	TERB			BROB	RECB	REEB	TERB			BNIF	BNIP
		76.	76.	76.	76.			76.	76.	76.	76.			76.80.40	76.80.31
RUN*	BR											BRANCH	RUN-PIPE		
20*	15		33.70.066.1	33.72.066.1	36.90.003.1	400*	50	79.62.114.1				15	40-150	341.1	401.1
25*	15		33.70.076.1	33.72.076.1	36.90.021.1	400*	80	79.62.124.1					200-600	342.1	402.1
25*	20		33.70.086.1	33.72.086.1	36.90.037.1	400*	100	79.62.133.1				20	40- 80	343.1	403.1
40*	15		33.70.096.1	33.72.096.1	36.90.053.1	400*	150	79.62.142.1	36.51.626.1	36.66.626.1	36.90.625.1		100-600	344.1	404.1
40*	20		33.70.116.1	33.72.116.1	36.90.071.1	400*	200	79.62.967.1	36.51.643.1	36.66.643.1	36.90.643.1	25	40- 40	345.1	405.1
40*	25		33.70.126.1	33.72.126.1	36.90.087.1	400*	250	79.62.973.1	36.51.652.1	36.66.652.1	36.90.652.1		50- 50	346.1	406.1
50*	20		36.51.094.1	36.66.094.1		400*	300	79.62.978.1	36.51.680.1	36.66.678.1			80-100	347.1	407.1
50*	25		33.70.136.1	33.72.136.1	36.90.121.1	400*	350	79.61.530.1	36.51.687.1	36.66.687.1	36.90.687.1		150-600	348.1	408.1
50*	40		33.70.146.1	33.72.146.1	36.90.137.1	450*	50	79.62.115.1				40	50- 50	350.1	409.1
80*	40		33.70.176.1	33.72.176.1	36.90.153.1	450*	80	79.62.125.1					80- 80	351.1	410.1
80*	50	79.61.634.1	33.70.186.1	33.72.186.1		450*	100	79.62.134.1					100-100	352.1	411.1
100*	40		33.70.197.1	33.72.197.1		450*	150	79.62.143.1					150-300	353.1	412.1
100*	50	79.61.636.1	33.70.206.1	33.72.206.1	36.90.206.1	450*	200	79.62.968.1	36.51.706.1	36.66.706.1	36.90.710.1		350-600	354.1	413.1
100*	80	79.61.660.1	33.70.216.1	33.72.216.1	36.90.225.1	450*	250	79.62.974.1	36.51.718.1	36.66.718.1	36.90.718.1				
150*	50	79.61.638.1				450*	300	79.62.979.1	36.51.746.1	36.66.743.1					
150*	80	79.61.662.1	33.70.247.1	33.72.247.1	36.90.244.1	450*	350	79.61.531.1	36.51.753.1	36.66.753.1	36.90.753.1				
150*	100	79.61.684.1	33.70.257.1	33.72.257.1	36.90.261.1	450*	400	79.61.534.1	36.51.770.1	36.66.770.1	36.90.770.1				
200*	50	79.62.186.1				500*	50	79.62.116.1							
200*	80	79.62.208.1				500*	80	79.62.126.1							
200*	100	79.62.222.1	33.70.268.1	33.72.268.1	36.90.288.1	500*	100	79.62.135.1							
200*	150	79.62.232.1	33.70.280.1	33.72.280.1	36.90.312.1	500*	150	79.62.144.1							
250*	50	79.62.188.1				500*	200	79.62.969.1	36.51.797.1	36.66.797.1	36.90.795.1				
250*	80	79.62.210.1				500*	250	79.62.975.1	36.51.817.1	36.66.817.1	36.90.803.1				
250*	100	79.62.224.1	36.51.330.1	36.66.330.1		500*	300	79.62.980.1	36.51.830.1	36.66.830.1					
250*	150	79.62.234.1	36.51.359.1	36.66.359.1	36.90.359.1	500*	350	79.61.532.1	36.51.838.1	36.66.838.1	36.90.838.1			230	THERMOW LENGTH -----
250*	200	79.62.452.1	33.70.311.1	33.72.311.1		500*	400	79.61.535.1	36.51.855.1	36.66.855.1	36.90.855.1			255	
300*	50	79.62.190.1				500*	450	79.61.537.1	36.51.872.1	36.66.872.1	36.90.872.1			305	
300*	80	79.62.212.1				600*	50	79.62.117.1						355	
300*	100	79.62.226.1				600*	80	79.62.127.1						405	
300*	150	79.62.236.1	36.51.429.1	36.66.431.1		600*	100	79.62.136.1						455	
300*	200	79.62.454.1	33.70.333.1	33.72.333.1		600*	150	79.62.145.1							
300*	250	79.62.470.1	33.70.344.1	33.72.344.1		600*	200	79.62.970.1							
350*	50	79.62.113.1				600*	250	79.62.976.1	36.51.897.1	36.66.897.1	36.90.888.1				
350*	80	79.62.123.1				600*	300	79.62.981.1	36.51.918.1	36.66.918.1					
350*	100	79.62.132.1				600*	350	79.61.533.1	36.51.926.1	36.66.926.1	36.90.926.1				
350*	150	79.62.141.1	36.51.516.1	36.66.516.1	36.90.516.1	600*	400	79.61.536.1	36.51.946.1	36.66.946.1	36.90.946.1				
350*	200	79.62.966.1	36.51.548.1	36.66.548.1	36.90.548.1	600*	450	79.61.538.1	36.51.966.1	36.66.966.1	36.90.966.1				
350*	250	79.62.972.1	36.51.567.1	36.66.567.1	36.90.567.1	600*	500	79.61.539.1	36.51.986.1	36.66.986.1	36.90.986.1				
350*	300	79.62.977.1	36.51.605.1	36.66.605.1											

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
15	4	1/2	*	80	43.157.1	15	4	1/2	*	80	43.157.1
20	4	5/8	*	90	43.271.1	20	4	5/8	*	90	43.271.1
25	4	5/8	*	90	43.271.1	25	4	5/8	*	90	43.271.1
40	4	3/4	*	110	43.330.1	40	4	3/4	*	110	43.330.1
50	8	5/8	*	110	43.274.1						
80	8	3/4	*	130	43.334.1						
100	8	7/8	*	150	43.406.1						
150	12	1	*	170	43.474.1						
200	12	1 1/8	*	190	43.535.1						
250	16	1 1/4	*	220	43.597.1						
300	20	1 1/4	*	220	43.597.1						
350	20	1 3/8	*	240	43.646.1						
400	20	1 1/2	*	250	43.688.1						
450	20	1 5/8	*	280	38.722.1						
500	24	1 5/8	*	290	38.724.1						
600	24	1 7/8	*	330	38.786.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38						
DN	NR	INCH	* MM		DN	NR	INCH	* MM			
					15	4	1/2	*	90	43.159.1	
					20	4	5/8	*	100	43.273.1	
					25	4	5/8	*	100	43.273.1	
					40	4	3/4	*	120	43.332.1	
50	8	5/8	*	150	43.281.1	50	8	5/8	*	120	43.276.1
80	8	3/4	*	150	43.337.1	80	8	3/4	*	150	43.337.1
100	8	7/8	*	160	43.407.1	100	8	7/8	*	170	43.409.1
150	12	1	*	180	43.475.1	150	12	1	*	210	43.480.1
200	12	1 1/8	*	210	43.538.1	200	12	1 1/8	*	230	43.541.1
250	16	1 1/4	*	230	43.598.1	250	16	1 1/4	*	260	43.603.1
300	20	1 1/4	*	240	43.600.1	300	20	1 1/4	*	270	43.605.1
350	20	1 3/8	*	260	43.649.1	350	20	1 3/8	*	290	43.654.1
400	20	1 1/2	*	280	43.693.1	400	20	1 1/2	*	310	43.698.1
450	20	1 5/8	*	300	38.725.1	450	20	1 5/8	*	340	38.732.1
500	24	1 5/8	*	320	38.728.1	500	24	1 5/8	*	360	38.736.1
600	24	1 7/8	*	360	38.791.1	600	24	1 7/8	*	420	38.803.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.08.103.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	8	81.38.43.157.1	
WELDING NECK FLANGE	1	76.65.81.082.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.23.08.104.1	
PIPE NIPPLE 50MM	1	76.33.57.641.1	
STUD BOLT WITH NUTS	8	81.38.43.271.1	
WELDING NECK FLANGE	1	76.65.81.084.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.23.08.104.1	
STUD BOLT WITH NUTS	8	81.38.43.271.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.08.103.1	
LAP-JOINT FLANGE	2	76.65.20.352.1	
STUD BOLT WITH NUTS	8	81.38.43.157.1	
	8	81.38.43.157.1	
WELDING NECK FLANGE	2	76.65.81.082.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.08.103.1	
LAP-JOINT FLANGE	1	76.65.20.352.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	4	81.38.43.157.1	
	4	81.38.43.157.1	
WELDING NECK FLANGE	1	76.65.81.082.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GATE VALVE FLANGED	1	77.23.08.103.1	
LAP-JOINT FLANGE	1	76.65.20.352.1	
STUD BOLT WITH NUTS	4	81.38.43.157.1	
	4	81.38.43.157.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.104.1	
GATE VALVE FLANGED	2	77.23.08.103.1	
LAP-JOINT FLANGE	2	76.65.20.352.1	
STUD BOLT WITH NUTS	8	81.38.43.157.1	
	8	81.38.43.157.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.635.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.43.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.635.1	
GASKET, SPIRAL WOUND	1	85.41.46.112.1	
STUD BOLT WITH NUTS	4	81.38.43.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
GLOBE VALVE FLANGED	1	77.33.08.103.1	
PIPE NIPPLE 50MM	1	76.33.57.631.1	
STUD BOLT WITH NUTS	8	81.38.43.157.1	
WELDING NECK FLANGE	1	76.65.81.082.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.33.08.104.1	
PIPE NIPPLE 50MM	1	76.33.57.641.1	
STUD BOLT WITH NUTS	8	81.38.43.271.1	
WELDING NECK FLANGE	1	76.65.81.084.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GLOBE VALVE FLANGED	1	77.33.08.104.1	
STUD BOLT WITH NUTS	8	81.38.43.271.1	

PIPING CLASSES ASME RATING 900

CLASS 91011

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS							
		0	50	100	150	200	250	300	350

DN15 -400		PRESSURE BAR GA							
		153.0	150.1	139.1	135.7	131.3	125.0	116.0	110.8

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	E	A						
50	C	C	C	C	B	A							
40	C	B	B	A									
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	80
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL	PLANT	:	
CLASS NO. : 91011	CONSIGNEE	:	
ANS RATING : CLASS 900	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 91011, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

ASML PIPE (API 5L-B, SML)	DN 15-350	API 5L-B (SML)
AWSA PIPE (API 5L-B, SAW)	DN400-400	API 5L-B (WLD)
PIPE PIPE	DN 15-400	ASTM A106-B
PNPP PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL BLIND FLANGE	DN 15-400	ASTM A105
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL LAP-JOINT FLANGE	---	ASTM A105
SBFL SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVF GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
	DN 50-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 91011, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE															
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	071.1	109.1	157.1	223.1	263.1	303.1	347.1	395.1		
PIPE (API 5L-B, SAW)	74.13.17														449.1
PIPE	74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	223.1	263.1	303.1	347.1	395.1	449.1	
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1										
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	
SPECTACLE BLIND FLANGE	76.88.03	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
WELDING NECK FLANGE	76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1	
* FITTINGS															
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	120.1	141.1	162.1	185.1	205.1	225.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
* VALVES															
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1										
	77.10.20					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1										
	77.20.20					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1										
	77.30.20					208.1	160.1	162.1	164.1						
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.02.368.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.02.392.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.02.414.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.02.700.1	29.46.742.1	29.61.742.1	30.89.465.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.02.718.1	30.72.457.1	30.73.457.1	30.89.483.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.02.734.1	30.72.466.1	30.73.466.1	30.89.509.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.02.748.1	30.72.476.1	30.73.476.1	30.89.535.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.02.760.1	30.72.490.1	30.73.490.1	30.89.560.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1					
80* 40		30.72.227.1	30.73.227.1	30.89.124.1					
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1					
100* 40		30.72.251.1	30.73.251.1						
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1					
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1					
150* 50	79.02.358.1								
150* 80	79.02.382.1	30.72.299.1	30.73.299.1	30.89.184.1					
150*100	79.02.404.1	30.72.310.1	30.73.310.1	30.89.198.1					
200* 50	79.02.360.1								
200* 80	79.02.384.1								
200*100	79.02.406.1	30.72.319.1	30.73.319.1						
200*150	79.02.692.1	30.72.339.1	30.73.339.1	30.89.227.1					
250* 50	79.02.362.1								
250* 80	79.02.386.1								
250*100	79.02.408.1	29.46.352.1	29.61.352.1						
250*150	79.02.694.1	30.72.359.1	30.73.359.1	30.89.273.1					
250*200	79.02.712.1	30.72.369.1	30.73.369.1	30.89.295.1					
300* 50	79.02.364.1								
300* 80	79.02.388.1								
300*100	79.02.410.1								
300*150	79.02.696.1	30.72.387.1	30.73.387.1	30.89.312.1					
300*200	79.02.714.1	30.72.399.1	30.73.399.1	30.89.332.1					
300*250	79.02.730.1	30.72.409.1	30.73.409.1	30.89.354.1					
350* 50	79.02.366.1								
350* 80	79.02.390.1								
350*100	79.02.412.1								
350*150	79.02.698.1	30.72.417.1	30.73.417.1	30.89.375.1					
350*200	79.02.716.1	30.72.426.1	30.73.426.1	30.89.394.1					
350*250	79.02.732.1	30.72.440.1	30.73.440.1	30.89.419.1					
350*300	79.02.746.1	30.72.450.1	30.73.450.1	30.89.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	301.1	001.1
	200-400	302.1	002.1
20	40- 80	303.1	003.1
	100-400	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-400	308.1	008.1
40	50- 50	310.1	009.1
	80- 80	311.1	010.1
	100-100	312.1	011.1
	150-300	313.1	013.1
	350-400	314.1	014.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.102.1	230	76.83.37.101.1
813	76.80.60.104.1	255	76.83.37.102.1
1219	76.80.60.106.1	305	76.83.37.103.1
1524	76.80.60.108.1	355	76.83.37.105.1
1829	76.80.60.110.1	405	76.83.37.106.1
2134	76.80.60.112.1	455	76.83.37.107.1
2438	76.80.60.114.1		
2743	76.80.60.116.1		
3048	76.80.60.118.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 110	61.330.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	7/8	* 150	61.406.1					
100	8	1 1/8	* 170	61.532.1					
150	12	1 1/8	* 190	61.535.1					
200	12	1 3/8	* 220	61.643.1					
250	16	1 3/8	* 240	61.646.1					
300	20	1 3/8	* 250	61.647.1					
350	20	1 1/2	* 280	61.693.1					
400	20	1 5/8	* 290	61.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 160	61.407.1
80	8	7/8	* 160	61.407.1	80	8	7/8	* 170	61.409.1
100	8	1 1/8	* 180	61.533.1	100	8	1 1/8	* 200	61.525.1
150	12	1 1/8	* 210	61.538.1	150	12	1 1/8	* 230	61.541.1
200	12	1 3/8	* 240	61.646.1	200	12	1 3/8	* 270	61.641.1
250	16	1 3/8	* 250	61.647.1	250	16	1 3/8	* 290	61.654.1
300	20	1 3/8	* 280	61.652.1	300	20	1 3/8	* 310	61.656.1
350	20	1 1/2	* 300	61.696.1	350	20	1 1/2	* 350	61.704.1
400	20	1 5/8	* 310	61.727.1	400	20	1 5/8	* 360	61.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.62.79.902.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	4	81.38.61.330.1	
	1	76.62.79.902.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
	4	81.38.61.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

CLASS 91015

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS								
	0	100	150	200	250	300	350	400

PRESSURE BAR GA								
DN15 -400	137.5	137.5	135.5	131.3	125.0	116.0	110.8	103.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400		

400	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
350	C	C	C	C	E	E	E	E	E	E	E	E	A		
300	C	C	C	C	E	E	E	E	E	E	E	A			
250	C	C	C	C	E	E	E	E	E	E	A				
200	C	C	C	C	E	E	E	E	A						
150	C	C	C	C	E	E	E	A							
100	C	C	C	C	E	E	A								
80	C	C	C	C	E	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE

15	80
20	80
25	80
40	80
50	80
80	80
100	80
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 91015		CONSIGNEE	:	
ANS RATING : CLASS 900		ENGINEERED BY :		
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : B		CONTR.JOB NO. :		
REV. DATE : 12/98		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 91015, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 91015, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE	74.30.03	018.1	028.1	038.1	058.1	071.1	109.1	157.1	223.1	263.1	303.1	347.1	395.1	449.1	
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	
SPECTACLE BLIND FLANGE	76.88.37	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
SPACER RING TYPE (ASME FLANGE)	76.88.46	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
WELDING NECK FLANGE	76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1	
* FITTINGS															
CAP BUTT-WELD.END	76.30.17	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
EQUAL TEE BUTT-WELD ENDS	76.30.81	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
* VALVES															
CHECK VALVE BUTT-WELD ENDS	77.11.14	083.1	084.1	085.1	087.1										
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1	158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE BUTT-WELD ENDS	77.21.14	303.1	304.1	305.1	307.1										
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GLOBE VALVE BUTT-WELD ENDS	77.31.14	303.1	304.1	305.1	307.1										
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.66.137.1	30.67.137.1	30.88.035.1	400* 50	79.02.368.1			
25* 15		30.66.147.1	30.67.147.1	30.88.045.1	400* 80	79.02.392.1			
25* 20		30.66.157.1	30.67.157.1	30.88.055.1	400*100	79.02.414.1			
40* 15		30.66.167.1	30.67.167.1	30.88.065.1	400*150	79.02.700.1	29.47.742.1	29.62.742.1	30.88.465.1
40* 20		30.66.177.1	30.67.177.1	30.88.075.1	400*200	79.02.718.1	30.66.457.1	30.67.457.1	30.88.483.1
40* 25		30.66.187.1	30.67.187.1	30.88.085.1	400*250	79.02.734.1	30.66.466.1	30.67.466.1	30.88.509.1
50* 20		30.66.194.1	30.67.194.1	30.88.097.1	400*300	79.02.748.1	30.66.476.1	30.67.476.1	30.88.535.1
50* 25		30.66.197.1	30.67.197.1	30.88.106.1	400*350	79.02.760.1	30.66.490.1	30.67.490.1	30.88.560.1
50* 40		30.66.207.1	30.67.207.1	30.88.115.1					
80* 40		30.66.227.1	30.67.227.1	30.88.124.1					
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1					
100* 40		30.66.251.1	30.67.251.1	30.88.142.1					
100* 50	79.01.362.1	30.66.267.1	30.67.267.1	30.88.154.1					
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1					
150* 50	79.02.358.1								
150* 80	79.02.382.1	30.66.299.1	30.67.299.1						
150*100	79.02.404.1	30.66.310.1	30.67.310.1						
200* 50	79.02.360.1								
200* 80	79.02.384.1								
200*100	79.02.406.1	30.66.319.1	30.67.319.1						
200*150	79.02.692.1	30.66.339.1	30.67.339.1	30.88.227.1					
250* 50	79.02.362.1								
250* 80	79.02.386.1								
250*100	79.02.408.1	29.47.352.1	29.62.352.1						
250*150	79.02.694.1	30.66.359.1	30.67.359.1	30.88.273.1					
250*200	79.02.712.1	30.66.369.1	30.67.369.1	30.88.295.1					
300* 50	79.02.364.1								
300* 80	79.02.388.1								
300*100	79.02.410.1								
300*150	79.02.696.1	30.66.387.1	30.67.387.1	30.88.312.1					
300*200	79.02.714.1	30.66.399.1	30.67.399.1	30.88.332.1					
300*250	79.02.730.1	30.66.409.1	30.67.409.1	30.88.354.1					
350* 50	79.02.366.1								
350* 80	79.02.390.1								
350*100	79.02.412.1								
350*150	79.02.698.1	30.66.417.1	30.67.417.1	30.88.375.1					
350*200	79.02.716.1	30.66.426.1	30.67.426.1	30.88.394.1					
350*250	79.02.732.1	30.66.440.1	30.67.440.1	30.88.419.1					
350*300	79.02.746.1	30.66.450.1	30.67.450.1	30.88.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	301.1	001.1
	200-400	302.1	002.1
20	40- 80	303.1	003.1
	100-400	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-400	308.1	008.1
40	50- 50	310.1	009.1
	80- 80	311.1	010.1
	100-100	312.1	011.1
	150-300	313.1	013.1
	350-400	314.1	014.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.462.1	230	76.83.37.101.1
813	76.80.60.464.1	255	76.83.37.102.1
1219	76.80.60.466.1	305	76.83.37.103.1
1524	76.80.60.468.1	355	76.83.37.105.1
1829	76.80.60.470.1	405	76.83.37.106.1
2134	76.80.60.472.1	455	76.83.37.107.1
2438	76.80.60.474.1		
2743	76.80.60.476.1		
3048	76.80.60.478.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	66.330.1	15	4	3/4	* 110	66.330.1
20	4	3/4	* 110	66.330.1	20	4	3/4	* 120	66.332.1
25	4	7/8	* 130	66.403.1	25	4	7/8	* 130	66.403.1
40	4	1	* 140	66.469.1	40	4	1	* 140	66.469.1
50	8	7/8	* 150	66.406.1					
80	8	7/8	* 150	66.406.1					
100	8	1 1/8	* 170	66.532.1					
150	12	1 1/8	* 190	66.535.1					
200	12	1 3/8	* 220	66.643.1					
250	16	1 3/8	* 240	66.646.1					
300	20	1 3/8	* 250	66.647.1					
350	20	1 1/2	* 280	66.693.1					
400	20	1 5/8	* 290	66.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	66.332.1
					20	4	3/4	* 130	66.334.1
					25	4	7/8	* 140	66.404.1
					40	4	1	* 160	66.472.1
50	8	7/8	* 160	66.407.1	50	8	7/8	* 160	66.407.1
80	8	7/8	* 160	66.407.1	80	8	7/8	* 170	66.409.1
100	8	1 1/8	* 180	66.533.1	100	8	1 1/8	* 200	66.525.1
150	12	1 1/8	* 210	66.538.1	150	12	1 1/8	* 230	66.541.1
200	12	1 3/8	* 240	66.646.1	200	12	1 3/8	* 270	66.662.1
250	16	1 3/8	* 250	66.647.1	250	16	1 3/8	* 290	66.654.1
300	20	1 3/8	* 280	66.652.1	300	20	1 3/8	* 310	66.656.1
350	20	1 1/2	* 300	66.696.1	350	20	1 1/2	* 350	66.704.1
400	20	1 5/8	* 310	66.727.1	400	20	1 5/8	* 360	66.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	2	76.62.79.902.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
WELDING NECK FLANGE	4	81.38.66.330.1	
	1	76.62.79.902.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
	4	81.38.66.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
	8	81.38.66.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.66.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.66.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	

CLASS 91031

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
		0	50	100	150	200	250	300	350	400

PRESSURE BAR GA										
DN15 -400		153.0	150.1	139.2	135.7	131.3	125.0	116.0	110.8	103.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	A							
50	C	C	C	C	B	A							
40	C	B	B	A									
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	120
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 91031	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE PIPE DN 15-400 ASTM A106-B

* FLANGES

BLFL BLIND FLANGE DN 15-400 ASTM A105
COFL COVER FLANGE THERMOWELL NOZZLE --- ASTM A105
LJFL LAP-JOINT FLANGE --- ASTM A105
SBFL SPECTACLE BLIND FLANGE DN 15-400 ASTM A516-60
SPRT SPACER RING TYPE (ASME FLANGE) DN 15-400 ASTM A516-60
WNFL WELDING NECK FLANGE DN 15-400 ASTM A105

* FITTINGS

CAPB CAP BUTT-WELD.END DN 15-400 ASTM A234-WPB
E45B ELBOW 45 DEG BUTT-WELD ENDS DN 15-400 ASTM A234-WPB
E90B ELBOW 90 DEG BUTT-WELD ENDS DN 15-400 ASTM A234-WPB
TEEB EQUAL TEE BUTT-WELD ENDS DN 15-400 ASTM A234-WPB

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET DN 15- 50 ASTM A105
BNIP BRANCH FITTING PLAIN-END OUTL. DN 15- 50 ASTM A105
BROB BRANCH OUTLET RED. BUTT WELD DN 80-400 ASTM A105
RECB REDUCER CONC BUTT WELD ENDS DN 20-400 ASTM A234-WPB
REEB REDUCER ECC BUTT WELD ENDS DN 20-400 ASTM A234-WPB
TERB TEE REDUCING BUTT WELD ENDS DN 20-400 ASTM A234-WPB

* VALVES

CHVF CHECK VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316 (L),STELLITE 6
DN 50-400 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

GAVF GATE VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316 (L),STELLITE 6
DN 50-400 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

GLVF GLOBE VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316 (L),STELLITE 6
DN 50-150 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND

DN 15-400 AISI 316 (L),GRAPHITE FILLED
CS CENTRING-/SS INNER RING

LDPC LEVEL DISPLACER CHAMBER

DN100-100 ASTM A106-B

MTRR METER RUN

DN 15- 40 AISI 316
LJ END FLANGES: ASTM A105

ORFS ORIFICE FLANGE SET

DN 50-400 ASTM A105

STBT STUD BOLT WITH NUTS

--- ASTM A193-B7/A194-2H

TWSG THERMOWELL STRAIGHT

DN 40- 40 AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 91031, REV.A PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE	74.30.05	020.1	030.1	040.1	060.1	073.1	113.1	159.1	223.1	263.1	303.1	347.1	395.1	449.1	
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	
SPECTACLE BLIND FLANGE	76.88.03	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
WELDING NECK FLANGE	76.62.79	962.1	964.1	966.1	968.1	970.1	886.1	864.1	866.1	868.1	870.1	872.1	874.1	876.1	
* FITTINGS															
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	062.1	082.1	100.1	120.1	141.1	162.1	185.1	205.1	225.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
* VALVES															
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1										
	77.10.20					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1										
	77.20.20					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1										
	77.30.20					208.1	160.1	162.1	164.1						
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					970.1	886.1	864.1	866.1	868.1	870.1	872.1	874.1	876.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.03.007.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.03.020.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.02.680.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.02.700.1	29.46.742.1	29.61.742.1	30.89.465.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.02.718.1	30.72.457.1	30.73.457.1	30.89.483.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.02.734.1	30.72.466.1	30.73.466.1	30.89.509.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.02.748.1	30.72.476.1	30.73.476.1	30.89.535.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.02.760.1	30.72.490.1	30.73.490.1	30.89.560.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1					
80* 40		30.72.231.1	30.73.231.1						
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1					
100* 40		30.72.255.1	30.73.255.1						
100* 50	79.03.001.1	30.72.270.1	30.73.270.1	30.89.161.1					
100* 80	79.03.014.1	30.72.280.1	30.73.280.1	30.89.173.1					
150* 50	79.03.002.1								
150* 80	79.03.015.1	30.72.300.1	30.73.300.1	30.89.185.1					
150*100	79.02.670.1	30.72.309.1	30.73.309.1	30.89.191.1					
200* 50	79.03.003.1								
200* 80	79.03.016.1								
200*100	79.02.672.1	30.72.329.1	30.73.329.1	30.89.207.1					
200*150	79.02.692.1	30.72.339.1	30.73.339.1	30.89.227.1					
250* 50	79.03.004.1								
250* 80	79.03.017.1								
250*100	79.02.674.1	30.72.347.1	30.73.347.1	30.89.255.1					
250*150	79.02.694.1	30.72.359.1	30.73.359.1	30.89.273.1					
250*200	79.02.712.1	30.72.369.1	30.73.369.1	30.89.295.1					
300* 50	79.03.005.1								
300* 80	79.03.018.1								
300*100	79.02.676.1								
300*150	79.02.696.1	30.72.387.1	30.73.387.1	30.89.312.1					
300*200	79.02.714.1	30.72.399.1	30.73.399.1	30.89.332.1					
300*250	79.02.730.1	30.72.409.1	30.73.409.1	30.89.354.1					
350* 50	79.03.006.1								
350* 80	79.03.019.1								
350*100	79.02.678.1								
350*150	79.02.698.1	30.72.417.1	30.73.417.1	30.89.375.1					
350*200	79.02.716.1	30.72.426.1	30.73.426.1	30.89.394.1					
350*250	79.02.732.1	30.72.440.1	30.73.440.1	30.89.419.1					
350*300	79.02.746.1	30.72.450.1	30.73.450.1	30.89.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	321.1	016.1
20	40-400	323.1	018.1
25	40-100	325.1	020.1
	150-400	326.1	024.1
40	50-100	330.1	026.1
	150-400	331.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.102.1		230	76.83.37.101.1
813	76.80.60.104.1		255	76.83.37.102.1
1219	76.80.60.106.1		305	76.83.37.103.1
1524	76.80.60.108.1		355	76.83.37.105.1
1829	76.80.60.110.1		405	76.83.37.106.1
2134	76.80.60.112.1		455	76.83.37.107.1
2438	76.80.60.114.1			
2743	76.80.60.116.1			
3048	76.80.60.118.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 110	61.330.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	7/8	* 150	61.406.1					
100	8	1 1/8	* 170	61.532.1					
150	12	1 1/8	* 190	61.535.1					
200	12	1 3/8	* 220	61.643.1					
250	16	1 3/8	* 240	61.646.1					
300	20	1 3/8	* 250	61.647.1					
350	20	1 1/2	* 280	61.693.1					
400	20	1 5/8	* 290	61.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 160	61.407.1
80	8	7/8	* 160	61.407.1	80	8	7/8	* 170	61.409.1
100	8	1 1/8	* 180	61.533.1	100	8	1 1/8	* 200	61.525.1
150	12	1 1/8	* 210	61.538.1	150	12	1 1/8	* 230	61.541.1
200	12	1 3/8	* 240	61.646.1	200	12	1 3/8	* 270	61.641.1
250	16	1 3/8	* 250	61.647.1	250	16	1 3/8	* 290	61.654.1
300	20	1 3/8	* 280	61.652.1	300	20	1 3/8	* 310	61.656.1
350	20	1 1/2	* 300	61.696.1	350	20	1 1/2	* 350	61.704.1
400	20	1 5/8	* 310	61.727.1	400	20	1 5/8	* 360	61.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	4	81.38.61.330.1	
	1	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
	4	81.38.61.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

CLASS 91041

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS							
		0	50	100	150	200	250	300	350

DN15 -400		PRESSURE BAR GA							
		153.0	150.1	139.1	135.7	131.3	125.0	116.0	110.8

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	E	A						
50	C	C	C	C	B	A							
40	C	B	B	A									
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	80
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 91041	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 91041, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 91041, REV.A PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE															
PIPE		74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	223.1	263.1	303.1	347.1	395.1	449.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1									
* FLANGES															
BLIND FLANGE		76.62.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1
SPECTACLE BLIND FLANGE		76.88.03	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1
WELDING NECK FLANGE		76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1
* FITTINGS															
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	120.1	141.1	162.1	185.1	205.1	225.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1
* VALVES															
CHECK VALVE FLANGED		77.10.05	203.1	204.1	205.1	207.1	158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
GATE VALVE FLANGED		77.20.04	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
GLOBE VALVE FLANGED		77.30.05	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1					
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1
METER RUN		76.65.96	282.1	284.1	286.1	288.1									
ORIFICE FLANGE SET		76.62.95					910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.02.368.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.02.392.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.02.414.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.02.700.1	29.46.742.1	29.61.742.1	30.89.465.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.02.718.1	30.72.457.1	30.73.457.1	30.89.483.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.02.734.1	30.72.466.1	30.73.466.1	30.89.509.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.02.748.1	30.72.476.1	30.73.476.1	30.89.535.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.02.760.1	30.72.490.1	30.73.490.1	30.89.560.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1					
80* 40		30.72.227.1	30.73.227.1	30.89.124.1					
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1					
100* 40		30.72.251.1	30.73.251.1						
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1					
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1					
150* 50	79.02.358.1								
150* 80	79.02.382.1	30.72.299.1	30.73.299.1	30.89.184.1					
150*100	79.02.404.1	30.72.310.1	30.73.310.1	30.89.198.1					
200* 50	79.02.360.1								
200* 80	79.02.384.1								
200*100	79.02.406.1	30.72.319.1	30.73.319.1						
200*150	79.02.692.1	30.72.339.1	30.73.339.1	30.89.227.1					
250* 50	79.02.362.1								
250* 80	79.02.386.1								
250*100	79.02.408.1	29.46.352.1	29.61.352.1						
250*150	79.02.694.1	30.72.359.1	30.73.359.1	30.89.273.1					
250*200	79.02.712.1	30.72.369.1	30.73.369.1	30.89.295.1					
300* 50	79.02.364.1								
300* 80	79.02.388.1								
300*100	79.02.410.1								
300*150	79.02.696.1	30.72.387.1	30.73.387.1	30.89.312.1					
300*200	79.02.714.1	30.72.399.1	30.73.399.1	30.89.332.1					
300*250	79.02.730.1	30.72.409.1	30.73.409.1	30.89.354.1					
350* 50	79.02.366.1								
350* 80	79.02.390.1								
350*100	79.02.412.1								
350*150	79.02.698.1	30.72.417.1	30.73.417.1	30.89.375.1					
350*200	79.02.716.1	30.72.426.1	30.73.426.1	30.89.394.1					
350*250	79.02.732.1	30.72.440.1	30.73.440.1	30.89.419.1					
350*300	79.02.746.1	30.72.450.1	30.73.450.1	30.89.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	301.1	001.1
	200-400	302.1	002.1
20	40- 80	303.1	003.1
	100-400	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-400	308.1	008.1
40	50- 50	310.1	009.1
	80- 80	311.1	010.1
	100-100	312.1	011.1
	150-300	313.1	013.1
	350-400	314.1	014.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.102.1	230	76.83.37.101.1
813	76.80.60.104.1	255	76.83.37.102.1
1219	76.80.60.106.1	305	76.83.37.103.1
1524	76.80.60.108.1	355	76.83.37.105.1
1829	76.80.60.110.1	405	76.83.37.106.1
2134	76.80.60.112.1	455	76.83.37.107.1
2438	76.80.60.114.1		
2743	76.80.60.116.1		
3048	76.80.60.118.1		

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 110	61.330.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	7/8	* 150	61.406.1					
100	8	1 1/8	* 170	61.532.1					
150	12	1 1/8	* 190	61.535.1					
200	12	1 3/8	* 220	61.643.1					
250	16	1 3/8	* 240	61.646.1					
300	20	1 3/8	* 250	61.647.1					
350	20	1 1/2	* 280	61.693.1					
400	20	1 5/8	* 290	61.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 160	61.407.1
80	8	7/8	* 160	61.407.1	80	8	7/8	* 170	61.409.1
100	8	1 1/8	* 180	61.533.1	100	8	1 1/8	* 200	61.525.1
150	12	1 1/8	* 210	61.538.1	150	12	1 1/8	* 230	61.541.1
200	12	1 3/8	* 240	61.646.1	200	12	1 3/8	* 270	61.641.1
250	16	1 3/8	* 250	61.647.1	250	16	1 3/8	* 290	61.654.1
300	20	1 3/8	* 280	61.652.1	300	20	1 3/8	* 310	61.656.1
350	20	1 1/2	* 300	61.696.1	350	20	1 1/2	* 350	61.704.1
400	20	1 5/8	* 310	61.727.1	400	20	1 5/8	* 360	61.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.62.79.902.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	4	81.38.61.330.1	
	1	76.62.79.902.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
	4	81.38.61.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

CLASS 91042

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
		0	50	100	150	200	250	300	350	400

PRESSURE BAR GA										
DN15 -400		153.0	150.1	139.2	135.7	131.3	125.0	116.0	110.8	103.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	A							
50	C	C	C	C	B	A							
40	C	B	B	A									
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	120
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 91042	CONSIGNEE	:	
ANS RATING : CLASS 900	ENGINEERED BY :		
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO. :		
REV. DATE : 12/98	PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 91042, REV.A PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE	74.30.05	020.1	030.1	040.1	060.1	073.1	113.1	159.1	223.1	263.1	303.1	347.1	395.1	449.1	
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	
SPECTACLE BLIND FLANGE	76.88.03	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
WELDING NECK FLANGE	76.62.79	962.1	964.1	966.1	968.1	970.1	886.1	864.1	866.1	868.1	870.1	872.1	874.1	876.1	
* FITTINGS															
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	062.1	082.1	100.1	120.1	141.1	162.1	185.1	205.1	225.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
* VALVES															
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1	158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					970.1	886.1	864.1	866.1	868.1	870.1	872.1	874.1	876.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.03.007.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.03.020.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.02.680.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.02.700.1	29.46.742.1	29.61.742.1	30.89.465.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.02.718.1	30.72.457.1	30.73.457.1	30.89.483.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.02.734.1	30.72.466.1	30.73.466.1	30.89.509.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.02.748.1	30.72.476.1	30.73.476.1	30.89.535.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.02.760.1	30.72.490.1	30.73.490.1	30.89.560.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1					
80* 40		30.72.231.1	30.73.231.1						
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1					
100* 40		30.72.255.1	30.73.255.1						
100* 50	79.03.001.1	30.72.270.1	30.73.270.1	30.89.161.1					
100* 80	79.03.014.1	30.72.280.1	30.73.280.1	30.89.173.1					
150* 50	79.03.002.1								
150* 80	79.03.015.1	30.72.300.1	30.73.300.1	30.89.185.1					
150*100	79.02.670.1	30.72.309.1	30.73.309.1	30.89.191.1					
200* 50	79.03.003.1								
200* 80	79.03.016.1								
200*100	79.02.672.1	30.72.329.1	30.73.329.1	30.89.207.1					
200*150	79.02.692.1	30.72.339.1	30.73.339.1	30.89.227.1					
250* 50	79.03.004.1								
250* 80	79.03.017.1								
250*100	79.02.674.1	30.72.347.1	30.73.347.1	30.89.255.1					
250*150	79.02.694.1	30.72.359.1	30.73.359.1	30.89.273.1					
250*200	79.02.712.1	30.72.369.1	30.73.369.1	30.89.295.1					
300* 50	79.03.005.1								
300* 80	79.03.018.1								
300*100	79.02.676.1								
300*150	79.02.696.1	30.72.387.1	30.73.387.1	30.89.312.1					
300*200	79.02.714.1	30.72.399.1	30.73.399.1	30.89.332.1					
300*250	79.02.730.1	30.72.409.1	30.73.409.1	30.89.354.1					
350* 50	79.03.006.1								
350* 80	79.03.019.1								
350*100	79.02.678.1								
350*150	79.02.698.1	30.72.417.1	30.73.417.1	30.89.375.1					
350*200	79.02.716.1	30.72.426.1	30.73.426.1	30.89.394.1					
350*250	79.02.732.1	30.72.440.1	30.73.440.1	30.89.419.1					
350*300	79.02.746.1	30.72.450.1	30.73.450.1	30.89.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	321.1	016.1
20	40-400	323.1	018.1
25	40-100	325.1	020.1
	150-400	326.1	024.1
40	50-100	330.1	026.1
	150-400	331.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.102.1		230	76.83.37.101.1
813	76.80.60.104.1		255	76.83.37.102.1
1219	76.80.60.106.1		305	76.83.37.103.1
1524	76.80.60.108.1		355	76.83.37.105.1
1829	76.80.60.110.1		405	76.83.37.106.1
2134	76.80.60.112.1		455	76.83.37.107.1
2438	76.80.60.114.1			
2743	76.80.60.116.1			
3048	76.80.60.118.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 110	61.330.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	7/8	* 150	61.406.1					
100	8	1 1/8	* 170	61.532.1					
150	12	1 1/8	* 190	61.535.1					
200	12	1 3/8	* 220	61.643.1					
250	16	1 3/8	* 240	61.646.1					
300	20	1 3/8	* 250	61.647.1					
350	20	1 1/2	* 280	61.693.1					
400	20	1 5/8	* 290	61.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 160	61.407.1
80	8	7/8	* 160	61.407.1	80	8	7/8	* 170	61.409.1
100	8	1 1/8	* 180	61.533.1	100	8	1 1/8	* 200	61.525.1
150	12	1 1/8	* 210	61.538.1	150	12	1 1/8	* 230	61.541.1
200	12	1 3/8	* 240	61.646.1	200	12	1 3/8	* 270	61.641.1
250	16	1 3/8	* 250	61.647.1	250	16	1 3/8	* 290	61.654.1
300	20	1 3/8	* 280	61.652.1	300	20	1 3/8	* 310	61.656.1
350	20	1 1/2	* 300	61.696.1	350	20	1 1/2	* 350	61.704.1
400	20	1 5/8	* 310	61.727.1	400	20	1 5/8	* 360	61.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	4	81.38.61.330.1	
	1	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
	4	81.38.61.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

CLASS 91055

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	100	150	200	250	300	350	400

	PRESSURE BAR GA							
DN15 -400	137.5	137.5	135.7	131.3	125.0	116.0	110.8	103.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
350	C	C	C	C	E	E	E	E	E	E	E	E	A		
300	C	C	C	C	E	E	E	E	E	E	E	A			
250	C	C	C	C	E	E	E	E	E	E	A				
200	C	C	C	C	E	E	E	E	A						
150	C	C	C	C	E	E	E	A							
100	C	C	C	C	E	E	A								
80	C	C	C	C	E	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	120
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 91055		CONSIGNEE	:	
ANS RATING : CLASS 900		ENGINEERED BY	:	
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : B		CONTR.JOB NO.	:	
REV. DATE : 12/98		PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 91055, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE	74.30.03	020.1	030.1	040.1	060.1	073.1	113.1	159.1	223.1	263.1	303.1	347.1	395.1	449.1	

* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	
SPECTACLE BLIND FLANGE	76.88.37	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
SPACER RING TYPE (ASME FLANGE)	76.88.46	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
WELDING NECK FLANGE	76.62.79	962.1	964.1	966.1	968.1	970.1	886.1	864.1	866.1	868.1	870.1	872.1	874.1	876.1	

* FITTINGS															
CAP BUTT-WELD.END	76.30.17	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	
EQUAL TEE BUTT-WELD ENDS	76.30.81	572.1	578.1	582.1	592.1	612.1	632.1	650.1	670.1	691.1	712.1	735.1	755.1	775.1	

* VALVES															
CHECK VALVE BUTT-WELD ENDS	77.11.14	223.1	224.1	225.1	227.1										
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1	158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE BUTT-WELD ENDS	77.21.14	403.1	404.1	405.1	407.1										
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GLOBE VALVE BUTT-WELD ENDS	77.31.14	403.1	404.1	405.1	407.1										
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						

* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					970.1	886.1	864.1	866.1	868.1	870.1	872.1	874.1	876.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.03.007.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.03.020.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.02.680.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.02.700.1	29.47.742.1	29.62.742.1	30.88.465.1
40* 20		30.66.181.1	30.67.181.1		400*200	79.02.718.1	30.66.457.1	30.67.457.1	30.88.483.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250	79.02.734.1	30.66.466.1	30.67.466.1	30.88.509.1
50* 20		30.66.195.1	30.67.195.1		400*300	79.02.748.1	30.66.476.1	30.67.476.1	30.88.535.1
50* 25		30.66.201.1	30.67.201.1		400*350	79.02.760.1	30.66.490.1	30.67.490.1	30.88.560.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1					
80* 40		30.66.231.1	30.67.231.1						
80* 50	79.03.180.1	30.66.241.1	30.67.241.1	30.88.134.1					
100* 40		30.66.256.1	30.67.256.1						
100* 50	79.03.001.1	30.66.270.1	30.67.270.1	30.88.161.1					
100* 80	79.03.014.1	30.66.280.1	30.67.280.1	30.88.173.1					
150* 50	79.03.002.1								
150* 80	79.03.015.1	30.66.300.1	30.67.300.1	30.88.185.1					
150*100	79.02.670.1	30.66.309.1	30.67.309.1	30.88.191.1					
200* 50	79.03.003.1								
200* 80	79.03.016.1								
200*100	79.02.672.1	30.66.329.1	30.67.329.1	30.88.207.1					
200*150	79.02.692.1	30.66.339.1	30.67.339.1	30.88.227.1					
250* 50	79.03.004.1								
250* 80	79.03.017.1								
250*100	79.02.674.1	30.66.347.1	30.67.347.1	30.88.255.1					
250*150	79.02.694.1	30.66.359.1	30.67.359.1	30.88.273.1					
250*200	79.02.712.1	30.66.369.1	30.67.369.1	30.88.295.1					
300* 50	79.03.005.1								
300* 80	79.03.018.1								
300*100	79.02.676.1								
300*150	79.02.696.1	30.66.387.1	30.67.387.1	30.88.312.1					
300*200	79.02.714.1	30.66.399.1	30.67.399.1	30.88.332.1					
300*250	79.02.730.1	30.66.409.1	30.67.409.1	30.88.354.1					
350* 50	79.03.006.1								
350* 80	79.03.019.1								
350*100	79.02.678.1								
350*150	79.02.698.1	30.66.417.1	30.67.417.1	30.88.375.1					
350*200	79.02.716.1	30.66.426.1	30.67.426.1	30.88.394.1					
350*250	79.02.732.1	30.66.440.1	30.67.440.1	30.88.419.1					
350*300	79.02.746.1	30.66.450.1	30.67.450.1	30.88.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	321.1	016.1
20	40-400	323.1	018.1
25	40-100	325.1	020.1
	150-400	326.1	024.1
40	50-100	330.1	026.1
	150-400	331.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.462.1		230	76.83.37.101.1
813	76.80.60.464.1		255	76.83.37.102.1
1219	76.80.60.466.1		305	76.83.37.103.1
1524	76.80.60.468.1		355	76.83.37.105.1
1829	76.80.60.470.1		405	76.83.37.106.1
2134	76.80.60.472.1		455	76.83.37.107.1
2438	76.80.60.474.1			
2743	76.80.60.476.1			
3048	76.80.60.478.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	66.330.1	15	4	3/4	* 110	66.330.1
20	4	3/4	* 110	66.330.1	20	4	3/4	* 120	66.332.1
25	4	7/8	* 130	66.403.1	25	4	7/8	* 130	66.403.1
40	4	1	* 140	66.469.1	40	4	1	* 140	66.469.1
50	8	7/8	* 150	66.406.1					
80	8	7/8	* 150	66.406.1					
100	8	1 1/8	* 170	66.532.1					
150	12	1 1/8	* 190	66.535.1					
200	12	1 3/8	* 220	66.643.1					
250	16	1 3/8	* 240	66.646.1					
300	20	1 3/8	* 250	66.647.1					
350	20	1 1/2	* 280	66.693.1					
400	20	1 5/8	* 290	66.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	66.332.1
					20	4	3/4	* 130	66.334.1
					25	4	7/8	* 140	66.404.1
					40	4	1	* 160	66.472.1
50	8	7/8	* 160	66.407.1	50	8	7/8	* 160	66.407.1
80	8	7/8	* 160	66.407.1	80	8	7/8	* 170	66.409.1
100	8	1 1/8	* 180	66.533.1	100	8	1 1/8	* 200	66.525.1
150	12	1 1/8	* 210	66.538.1	150	12	1 1/8	* 230	66.541.1
200	12	1 3/8	* 240	66.646.1	200	12	1 3/8	* 270	66.662.1
250	16	1 3/8	* 250	66.647.1	250	16	1 3/8	* 290	66.654.1
300	20	1 3/8	* 280	66.652.1	300	20	1 3/8	* 310	66.656.1
350	20	1 1/2	* 300	66.696.1	350	20	1 1/2	* 350	66.704.1
400	20	1 5/8	* 310	66.727.1	400	20	1 5/8	* 360	66.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	2	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
WELDING NECK FLANGE	4	81.38.66.330.1	
	1	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
	4	81.38.66.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
	8	81.38.66.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.66.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.66.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	

CLASS 91071

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS							
		0	50	100	150	200	250	300	350

DN15 -400		PRESSURE BAR GA							
		153.0	150.1	139.1	135.7	131.3	125.0	116.0	110.8

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	E	A						
50	C	C	C	C	B	A							
40	C	B	B	A									
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	80
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 91071	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 91071, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 91071, REV.B PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE															
PIPE		74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	223.1	263.1	303.1	347.1	395.1	449.1
PIPE NIPPLE 50MM		76.30.57	431.1	441.1	451.1	471.1									
* FLANGES															
BLIND FLANGE		76.62.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1
SPECTACLE BLIND FLANGE		76.88.03	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1
WELDING NECK FLANGE		76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1
* FITTINGS															
CAP BUTT-WELD.END		76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	120.1	141.1	162.1	185.1	205.1	225.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1
* VALVES															
CHECK VALVE BUTT-WELD ENDS		77.11.36	183.1	184.1	185.1	187.1	188.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
GATE VALVE BUTT-WELD ENDS		77.21.36	153.1	154.1	155.1	157.1	158.1	160.1	162.1	164.1	165.1	167.1	168.1	169.1	170.1
GATE VALVE FLANGED		77.20.76	203.1	204.1	205.1	207.1	208.1								
GLOBE VALVE BUTT-WELD ENDS		77.31.36	153.1	154.1	155.1	157.1	158.1	160.1	162.1	164.1					
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1
METER RUN		76.65.96	282.1	284.1	286.1	288.1									
ORIFICE FLANGE SET		76.62.95					910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.02.368.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.02.392.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.02.414.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.02.700.1	29.46.742.1	29.61.742.1	30.89.465.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.02.718.1	30.72.457.1	30.73.457.1	30.89.483.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.02.734.1	30.72.466.1	30.73.466.1	30.89.509.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.02.748.1	30.72.476.1	30.73.476.1	30.89.535.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.02.760.1	30.72.490.1	30.73.490.1	30.89.560.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1					
80* 40		30.72.227.1	30.73.227.1	30.89.124.1					
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1					
100* 40		30.72.251.1	30.73.251.1						
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1					
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1					
150* 50	79.02.358.1								
150* 80	79.02.382.1	30.72.299.1	30.73.299.1	30.89.184.1					
150*100	79.02.404.1	30.72.310.1	30.73.310.1	30.89.198.1					
200* 50	79.02.360.1								
200* 80	79.02.384.1								
200*100	79.02.406.1	30.72.319.1	30.73.319.1						
200*150	79.02.692.1	30.72.339.1	30.73.339.1	30.89.227.1					
250* 50	79.02.362.1								
250* 80	79.02.386.1								
250*100	79.02.408.1	29.46.352.1	29.61.352.1						
250*150	79.02.694.1	30.72.359.1	30.73.359.1	30.89.273.1					
250*200	79.02.712.1	30.72.369.1	30.73.369.1	30.89.295.1					
300* 50	79.02.364.1								
300* 80	79.02.388.1								
300*100	79.02.410.1								
300*150	79.02.696.1	30.72.387.1	30.73.387.1	30.89.312.1					
300*200	79.02.714.1	30.72.399.1	30.73.399.1	30.89.332.1					
300*250	79.02.730.1	30.72.409.1	30.73.409.1	30.89.354.1					
350* 50	79.02.366.1								
350* 80	79.02.390.1								
350*100	79.02.412.1								
350*150	79.02.698.1	30.72.417.1	30.73.417.1	30.89.375.1					
350*200	79.02.716.1	30.72.426.1	30.73.426.1	30.89.394.1					
350*250	79.02.732.1	30.72.440.1	30.73.440.1	30.89.419.1					
350*300	79.02.746.1	30.72.450.1	30.73.450.1	30.89.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	301.1	001.1
	200-400	302.1	002.1
20	40- 80	303.1	003.1
	100-400	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-400	308.1	008.1
40	50- 50	310.1	009.1
	80- 80	311.1	010.1
	100-100	312.1	011.1
	150-300	313.1	013.1
	350-400	314.1	014.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----		-----	-----
356	76.80.60.102.1	230	76.83.37.101.1
813	76.80.60.104.1	255	76.83.37.102.1
1219	76.80.60.106.1	305	76.83.37.103.1
1524	76.80.60.108.1	355	76.83.37.105.1
1829	76.80.60.110.1	405	76.83.37.106.1
2134	76.80.60.112.1	455	76.83.37.107.1
2438	76.80.60.114.1		
2743	76.80.60.116.1		
3048	76.80.60.118.1		

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 110	61.330.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	7/8	* 150	61.406.1					
100	8	1 1/8	* 170	61.532.1					
150	12	1 1/8	* 190	61.535.1					
200	12	1 3/8	* 220	61.643.1					
250	16	1 3/8	* 240	61.646.1					
300	20	1 3/8	* 250	61.647.1					
350	20	1 1/2	* 280	61.693.1					
400	20	1 5/8	* 290	61.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 160	61.407.1
80	8	7/8	* 160	61.407.1	80	8	7/8	* 170	61.409.1
100	8	1 1/8	* 180	61.533.1	100	8	1 1/8	* 200	61.525.1
150	12	1 1/8	* 210	61.538.1	150	12	1 1/8	* 230	61.541.1
200	12	1 3/8	* 240	61.646.1	200	12	1 3/8	* 270	61.641.1
250	16	1 3/8	* 250	61.647.1	250	16	1 3/8	* 290	61.654.1
300	20	1 3/8	* 280	61.652.1	300	20	1 3/8	* 310	61.656.1
350	20	1 1/2	* 300	61.696.1	350	20	1 1/2	* 350	61.704.1
400	20	1 5/8	* 310	61.727.1	400	20	1 5/8	* 360	61.736.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0M DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.408.1
GASKET, SPIRAL WOUND 1 85.41.46.504.1
GATE VALVE BUTT-WELD ENDS 1 77.21.36.153.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.79.902.1

* DRAIN POINT DN 20 FIG.0M DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 1 85.41.46.506.1
GATE VALVE BUTT-WELD ENDS 1 77.21.36.154.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.79.904.1

* ORIFICE INSTR.CONN. DN 15 FIG.0M DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GATE VALVE BUTT-WELD ENDS 2 77.21.36.153.1
LAP-JOINT FLANGE 2 76.62.20.508.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 2 76.62.79.902.1

* PRESSURE INSTR.CONN. DN 15 FIG.0M DN 15 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.504.1
GATE VALVE BUTT-WELD ENDS 1 77.21.36.153.1
LAP-JOINT FLANGE 1 76.62.20.508.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.79.902.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.504.1
GATE VALVE FLANGED 2 77.20.76.203.1
LAP-JOINT FLANGE 2 76.62.20.508.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
STUD BOLT WITH NUTS 8 81.38.61.330.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.537.1
GASKET, SPIRAL WOUND 1 85.41.46.512.1
STUD BOLT WITH NUTS 4 81.38.61.472.1
THERMOWELL STRAIGHT L=230 MM 1 76.83.37.101.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.537.1
GASKET, SPIRAL WOUND 1 85.41.46.512.1
STUD BOLT WITH NUTS 4 81.38.61.472.1
THERMOWELL STRAIGHT L=255 MM 1 76.83.37.102.1

* VENT POINT DN 15 FIG.1M DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.408.1
GASKET, SPIRAL WOUND 1 85.41.46.504.1
GLOBE VALVE BUTT-WELD ENDS 1 77.31.36.153.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.79.902.1

* VENT POINT DN 20 FIG.1M DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 1 85.41.46.506.1
GLOBE VALVE BUTT-WELD ENDS 1 77.31.36.154.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.79.904.1

CLASS 91172

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	-50	0	50	100	150	200	250	300	340	

PRESSURE BAR GA										
DN15 -300	143.7	143.7	142.0	135.3	131.9	127.9	121.6	113.1	108.4	

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE										
	15	20	25	40	50	80	100	150	200	250	300
300	C	C	C	C	E	E	E	E	E	E	A
250	C	C	C	C	E	E	E	E	E	E	A
200	C	C	C	C	E	E	E	E	E	A	
150	C	C	C	C	E	E	E	E	A		
100	C	C	C	C	E	E	E	A			
80	C	C	C	C	E	A					
50	C	C	C	B	A						
40	C	B	B	A							
25	B	B	A								
20	B	A									
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	80
150	80
200	100
250	100
300	100

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LT F-GR	PLANT :	
CLASS NO. : 91172	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 91172, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A350-LF2
LJFL	LAP-JOINT FLANGE	---	ASTM A350-LF2
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A350-LF2

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A420-WPL6

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A350-LF2
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-300	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.30.17	021.1	029.1	037.1	053.1	061.1	069.1	077.1	086.1	099.1	111.1	123.1
PIPE NIPPLE 50MM		76.31.57	531.1	541.1	551.1	571.1							
* FLANGES													
BLIND FLANGE		76.62.12	658.1	662.1	666.1	668.1	670.1	622.1	624.1	626.1	628.1	630.1	632.1
SPECTACLE BLIND FLANGE		76.88.34	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1
SPACER RING TYPE (ASME FLANGE)		76.88.17	608.1	612.1	616.1	618.1	620.1	622.1	624.1	626.1	628.1	630.1	632.1
WELDING NECK FLANGE		76.62.86	552.1	554.1	556.1	558.1	560.1	362.1	364.1	366.1	388.1	390.1	392.1
* FITTINGS													
CAP BUTT-WELD.END		76.31.18	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1	290.1	311.1	334.1
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1	290.1	311.1	334.1
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1	290.1	311.1	334.1
EQUAL TEE BUTT-WELD ENDS		76.31.84	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1	290.1	311.1	334.1
* VALVES													
CHECK VALVE FLANGED		77.10.33	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1	166.1	167.1
GATE VALVE FLANGED		77.20.33	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1	166.1	167.1
GLOBE VALVE FLANGED		77.30.33	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1			
* MISCELLANEOUS													
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1
METER RUN		76.65.96	332.1	334.1	336.1	338.1							
ORIFICE FLANGE SET		76.62.97					910.1	832.1	834.1	836.1	848.1	850.1	852.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		31.70.137.1	31.71.137.1	31.85.035.1
25* 15		31.70.147.1	31.71.147.1	31.85.045.1
25* 20		31.70.157.1	31.71.157.1	31.85.055.1
40* 15		31.70.167.1	31.71.167.1	31.85.065.1
40* 20		31.70.177.1	31.71.177.1	31.85.075.1
40* 25		31.70.187.1	31.71.187.1	31.85.085.1
50* 20		31.70.194.1	31.71.194.1	31.85.097.1
50* 25		31.70.197.1	31.71.197.1	31.85.106.1
50* 40		31.70.207.1	31.71.207.1	31.85.115.1
80* 40		31.70.227.1	31.71.227.1	31.85.124.1
80* 50	79.05.360.1	31.70.237.1	31.71.237.1	31.85.133.1
100* 40		31.70.251.1	31.71.251.1	31.85.142.1
100* 50	79.05.362.1	31.70.267.1	31.71.267.1	31.85.154.1
100* 80	79.05.386.1	31.70.277.1	31.71.277.1	31.85.166.1
150* 50	79.05.364.1			
150* 80	79.05.388.1	31.70.297.1	31.71.297.1	31.85.178.1
150*100	79.05.410.1	31.70.307.1	31.71.307.1	31.85.190.1
200* 50	79.05.543.1			
200* 80	79.05.556.1			
200*100	79.05.568.1	31.70.330.1	31.71.330.1	31.85.216.1
200*150	79.05.580.1	31.70.340.1	31.71.340.1	31.85.236.1
250* 50	79.05.544.1			
250* 80	79.05.557.1			
250*100	79.05.569.1	29.44.350.1	29.59.350.1	31.85.263.1
250*150	79.05.581.1	31.70.354.1	31.71.354.1	31.85.280.1
250*200	79.05.693.1	31.70.368.1	31.71.368.1	31.85.294.1
300* 50	79.05.545.1			
300* 80	79.05.558.1			
300*100	79.05.570.1			
300*150	79.05.582.1	29.44.465.1	29.59.465.1	31.85.320.1
300*200	79.05.694.1	31.70.398.1	31.71.398.1	31.85.331.1
300*250	79.05.700.1	31.70.407.1	31.71.407.1	31.85.353.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	801.1	101.1
	200-300	802.1	102.1
20	40- 80	803.1	103.1
	100-300	804.1	104.1
25	40- 40	805.1	105.1
	50- 50	806.1	106.1
	80-100	807.1	107.1
	150-300	808.1	108.1
40	50- 50	810.1	109.1
	80- 80	811.1	110.1
	100-100	812.1	111.1
	150-300	813.1	113.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
356	76.80.60.302.1		230	76.83.37.101.1
813	76.80.60.304.1		255	76.83.37.102.1
1219	76.80.60.306.1		305	76.83.37.103.1
1524	76.80.60.308.1		355	76.83.37.105.1
1829	76.80.60.310.1		405	76.83.37.106.1
2134	76.80.60.312.1		455	76.83.37.107.1
2438	76.80.60.314.1			
2743	76.80.60.316.1			
3048	76.80.60.318.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	63.330.1	15	4	3/4	* 110	63.330.1
20	4	3/4	* 110	63.330.1	20	4	3/4	* 120	63.332.1
25	4	7/8	* 130	63.403.1	25	4	7/8	* 130	63.403.1
40	4	1	* 140	63.469.1	40	4	1	* 140	63.469.1
50	8	7/8	* 150	63.406.1					
80	8	7/8	* 150	63.406.1					
100	8	1 1/8	* 170	63.532.1					
150	12	1 1/8	* 190	63.535.1					
200	12	1 3/8	* 220	63.643.1					
250	16	1 3/8	* 240	63.646.1					
300	20	1 3/8	* 250	63.647.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	63.332.1
					20	4	3/4	* 130	63.334.1
					25	4	7/8	* 140	63.404.1
					40	4	1	* 160	63.472.1
50	8	7/8	* 160	63.407.1	50	8	7/8	* 160	63.407.1
80	8	7/8	* 160	63.407.1	80	8	7/8	* 170	63.409.1
100	8	1 1/8	* 180	63.533.1	100	8	1 1/8	* 200	63.524.1
150	12	1 1/8	* 210	63.538.1	150	12	1 1/8	* 230	63.541.1
200	12	1 3/8	* 240	63.646.1	200	12	1 3/8	* 270	63.652.1
250	16	1 3/8	* 250	63.647.1	250	16	1 3/8	* 290	63.654.1
300	20	1 3/8	* 280	63.653.1	300	20	1 3/8	* 310	63.656.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.658.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.33.203.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.330.1	
WELDING NECK FLANGE	1	76.62.86.552.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.662.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.33.204.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.330.1	
WELDING NECK FLANGE	1	76.62.86.554.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.662.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.33.204.1	
STUD BOLT WITH NUTS	8	81.38.63.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.33.203.1	
LAP-JOINT FLANGE	2	76.62.20.828.1	
STUD BOLT WITH NUTS	8	81.38.63.330.1	
	8	81.38.63.330.1	
WELDING NECK FLANGE	2	76.62.86.552.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.33.203.1	
LAP-JOINT FLANGE	1	76.62.20.828.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	4	81.38.63.330.1	
	4	81.38.63.330.1	
WELDING NECK FLANGE	1	76.62.86.552.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.33.203.1	
LAP-JOINT FLANGE	1	76.62.20.828.1	
STUD BOLT WITH NUTS	4	81.38.63.330.1	
	4	81.38.63.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.33.203.1	
LAP-JOINT FLANGE	2	76.62.20.828.1	
STUD BOLT WITH NUTS	8	81.38.63.330.1	
	8	81.38.63.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.63.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.52.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.63.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.658.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.33.203.1	
PIPE NIPPLE 50MM	1	76.31.57.531.1	
STUD BOLT WITH NUTS	8	81.38.63.330.1	
WELDING NECK FLANGE	1	76.62.86.552.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.662.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.33.204.1	
PIPE NIPPLE 50MM	1	76.31.57.541.1	
STUD BOLT WITH NUTS	8	81.38.63.330.1	
WELDING NECK FLANGE	1	76.62.86.554.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.12.662.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.33.204.1	
STUD BOLT WITH NUTS	8	81.38.63.330.1	

CLASS 91261

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400

		PRESSURE BAR GA								
DN15	-400	153.0	150.1	139.2	135.7	131.3	125.0	116.0	110.8	103.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - API 5L-B WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	A							
50	C	C	C	C	B	A							
40	C	C	B	B	A								
25	B	B	A										
20	B	B	A										
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	80
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 91261	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

ASML	PIPE (API 5L-B, SML)	DN 15-350	API 5L-B (SML)
AWSA	PIPE (API 5L-B, SAW)	DN400-400	API 5L-B (WLD)
PIPE	PIPE	DN 15-400	ASTM A106-B
PNNP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GABB	GATE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLBB	GLOBE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE (API 5L-B, SML)	74.13.12	018.1	028.1	038.1	058.1	071.1	109.1	157.1	223.1	263.1	303.1	347.1	395.1		
PIPE (API 5L-B, SAW)	74.13.17													449.1	
PIPE	74.30.05	018.1	028.1	038.1	058.1	071.1	109.1	157.1	223.1	263.1	303.1	347.1	395.1	449.1	
PIPE NIPPLE 50MM	76.30.57	431.1	441.1	451.1	471.1										
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1	
SPECTACLE BLIND FLANGE	76.88.03	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1	144.1	146.1	
WELDING NECK FLANGE	76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1	
* FITTINGS															
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	120.1	141.1	162.1	185.1	205.1	225.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	691.1	712.1	735.1	755.1	775.1	
* VALVES															
CHECK VALVE BUTT-WELD ENDS	77.11.37	153.1	154.1	155.1	157.1	158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE BW BELLOWS SEALED	77.21.14	853.1	854.1	855.1	857.1										
GATE VALVE BUTT-WELD ENDS	77.21.54	153.1	154.1	155.1	157.1	158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.77	203.1	204.1	205.1	207.1	208.1									
GLOBE VALVE BW BELLOWS SEALED	77.31.14	853.1	854.1	855.1	857.1										
GLOBE VALVE BUTT-WELD ENDS	77.31.38	153.1	154.1	155.1	157.1	158.1	160.1	162.1	164.1						
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1	
METER RUN	76.64.95	162.1	164.1	166.1	168.1										
ORIFICE FLANGE SET	76.62.95					910.1	832.1	834.1	866.1	868.1	870.1	872.1	874.1	876.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		30.72.137.1	30.73.137.1	30.89.035.1	400* 50	79.02.368.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.02.392.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.02.414.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150	79.02.700.1	29.46.742.1	29.61.742.1	30.89.465.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200	79.02.718.1	30.72.457.1	30.73.457.1	30.89.483.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250	79.02.734.1	30.72.466.1	30.73.466.1	30.89.509.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300	79.02.748.1	30.72.476.1	30.73.476.1	30.89.535.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350	79.02.760.1	30.72.490.1	30.73.490.1	30.89.560.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1					
80* 40		30.72.227.1	30.73.227.1	30.89.124.1					
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1					
100* 40		30.72.251.1	30.73.251.1						
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1					
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1					
150* 50	79.02.358.1								
150* 80	79.02.382.1	30.72.299.1	30.73.299.1	30.89.184.1					
150*100	79.02.404.1	30.72.310.1	30.73.310.1	30.89.198.1					
200* 50	79.02.360.1								
200* 80	79.02.384.1								
200*100	79.02.406.1	30.72.319.1	30.73.319.1						
200*150	79.02.692.1	30.72.339.1	30.73.339.1	30.89.227.1					
250* 50	79.02.362.1								
250* 80	79.02.386.1								
250*100	79.02.408.1	29.46.352.1	29.61.352.1						
250*150	79.02.694.1	30.72.359.1	30.73.359.1	30.89.273.1					
250*200	79.02.712.1	30.72.369.1	30.73.369.1	30.89.295.1					
300* 50	79.02.364.1								
300* 80	79.02.388.1								
300*100	79.02.410.1								
300*150	79.02.696.1	30.72.387.1	30.73.387.1	30.89.312.1					
300*200	79.02.714.1	30.72.399.1	30.73.399.1	30.89.332.1					
300*250	79.02.730.1	30.72.409.1	30.73.409.1	30.89.354.1					
350* 50	79.02.366.1								
350* 80	79.02.390.1								
350*100	79.02.412.1								
350*150	79.02.698.1	30.72.417.1	30.73.417.1	30.89.375.1					
350*200	79.02.716.1	30.72.426.1	30.73.426.1	30.89.394.1					
350*250	79.02.732.1	30.72.440.1	30.73.440.1	30.89.419.1					
350*300	79.02.746.1	30.72.450.1	30.73.450.1	30.89.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	301.1	001.1
	200-400	302.1	002.1
20	40- 80	303.1	003.1
	100-400	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-400	308.1	008.1
40	50- 50	310.1	009.1
	80- 80	311.1	010.1
	100-100	312.1	011.1
	150-300	313.1	013.1
	350-400	314.1	014.1

LEVEL	DISPLACER	CHAMBER	THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.102.1		230	76.83.37.101.1
813	76.80.60.104.1		255	76.83.37.102.1
1219	76.80.60.106.1		305	76.83.37.103.1
1524	76.80.60.108.1		355	76.83.37.105.1
1829	76.80.60.110.1		405	76.83.37.106.1
2134	76.80.60.112.1		455	76.83.37.107.1
2438	76.80.60.114.1			
2743	76.80.60.116.1			
3048	76.80.60.118.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 110	61.330.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	7/8	* 150	61.406.1					
100	8	1 1/8	* 170	61.532.1					
150	12	1 1/8	* 190	61.535.1					
200	12	1 3/8	* 220	61.643.1					
250	16	1 3/8	* 240	61.646.1					
300	20	1 3/8	* 250	61.647.1					
350	20	1 1/2	* 280	61.693.1					
400	20	1 5/8	* 290	61.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 160	61.407.1
80	8	7/8	* 160	61.407.1	80	8	7/8	* 170	61.409.1
100	8	1 1/8	* 180	61.533.1	100	8	1 1/8	* 200	61.525.1
150	12	1 1/8	* 210	61.538.1	150	12	1 1/8	* 230	61.541.1
200	12	1 3/8	* 240	61.646.1	200	12	1 3/8	* 270	61.641.1
250	16	1 3/8	* 250	61.647.1	250	16	1 3/8	* 290	61.654.1
300	20	1 3/8	* 280	61.652.1	300	20	1 3/8	* 310	61.656.1
350	20	1 1/2	* 300	61.696.1	350	20	1 1/2	* 350	61.704.1
400	20	1 5/8	* 310	61.727.1	400	20	1 5/8	* 360	61.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.54.153.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.54.154.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.54.154.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.1M	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS	2	77.31.38.153.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.62.79.902.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.54.153.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.54.153.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.77.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.38.153.1	
PIPE NIPPLE 50MM	1	76.30.57.431.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.902.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.38.154.1	
PIPE NIPPLE 50MM	1	76.30.57.441.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.38.154.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.904.1	

CLASS 92010

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -400	155.1	155.1	154.1	149.1	143.1	138.1	128.6	120.7	109.7	101.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	A							
50	C	C	C	C	B	A							
40	C	B	B	A									
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	120
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 92010	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316 (L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A335-P11
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION		MESC													

* PIPE															
PIPE		74.33.11	021.1	029.1	037.1	053.1	061.1	069.1	078.1	087.1	099.1	111.1	123.1	134.1	144.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1									
* FLANGES															
BLIND FLANGE		76.64.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1
SPECTACLE BLIND FLANGE		76.88.07	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1	534.1	536.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	358.1	362.1	366.1	368.1	370.1	372.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1
WELDING NECK FLANGE		76.64.79	576.1	578.1	580.1	582.1	584.1	496.1	538.1	540.1	542.1	544.1	546.1	548.1	550.1
* FITTINGS															
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	417.1	427.1	439.1	449.1	459.1	469.1	479.1	489.1	499.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
* VALVES															
CHECK VALVE FLANGED		77.13.60	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
GATE VALVE FLANGED		77.23.60	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
GLOBE VALVE FLANGED		77.33.60	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1					
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1
METER RUN		76.64.95	162.1	164.1	166.1	168.1									
ORIFICE FLANGE SET		76.64.91					584.1	496.1	538.1	540.1	542.1	544.1	546.1	548.1	550.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	
	76.	76.	76.	76.		76.	76.	76.	
RUN* BR	.								
20* 15		32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.26.368.1			
25* 15		32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.26.392.1			
25* 20		32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.26.680.1			
40* 15		32.68.032.1	32.69.032.1		400*150	79.26.700.1	32.68.349.1	32.69.349.1	
40* 20		32.68.042.1	32.69.042.1		400*200	79.26.718.1	32.68.353.1	32.69.353.1	
40* 25		32.68.052.1	32.69.052.1		400*250	79.26.734.1	32.68.363.1	32.69.363.1	
50* 20		32.68.066.1	32.69.066.1		400*300	79.26.748.1	32.68.373.1	32.69.373.1	
50* 25		32.68.072.1	32.69.072.1		400*350	79.26.760.1	32.68.383.1	32.69.383.1	
50* 40		32.68.082.1	32.69.082.1						
80* 40		32.68.092.1	32.69.092.1						
80* 50	79.25.360.1	32.68.102.1	32.69.102.1						
100* 50	79.26.356.1	32.68.131.1	32.69.131.1						
100* 80	79.26.380.1	32.68.146.1	32.69.146.1						
150* 50	79.26.358.1								
150* 80	79.26.382.1	32.68.161.1	32.69.161.1						
150*100	79.26.670.1	32.68.172.1	32.69.172.1						
200* 50	79.26.360.1								
200* 80	79.26.384.1								
200*100	79.26.672.1	32.68.192.1	32.69.192.1						
200*150	79.26.692.1	32.68.217.1	32.69.217.1						
250* 50	79.26.362.1								
250* 80	79.26.386.1								
250*100	79.26.674.1								
250*150	79.26.694.1	32.68.257.1	32.69.257.1						
250*200	79.26.712.1	32.68.273.1	32.69.273.1						
300* 50	79.26.364.1								
300* 80	79.26.388.1								
300*100	79.26.676.1								
300*150	79.26.696.1	32.68.283.1	32.69.283.1						
300*200	79.26.714.1	32.68.293.1	32.69.293.1						
300*250	79.26.730.1	32.68.303.1	32.69.303.1						
350* 50	79.26.366.1								
350* 80	79.26.390.1								
350*100	79.26.678.1								
350*150	79.26.698.1	32.68.313.1	32.69.313.1						
350*200	79.26.716.1	32.68.323.1	32.69.323.1						
350*250	79.26.732.1	32.68.333.1	32.69.333.1						
350*300	79.26.746.1	32.68.343.1	32.69.343.1						

		BNIF	BNIP
		76.80.38	76.80.31
BRANCH	RUN-PIPE		
15	40-150	421.1	181.1
	200-400	422.1	182.1
20	40- 80	423.1	183.1
	100-400	424.1	184.1
25	40- 40	425.1	185.1
	50- 50	426.1	186.1
	80-100	427.1	187.1
	150-400	428.1	188.1
40	50- 50	430.1	189.1
	80- 80	431.1	190.1
	100-100	432.1	191.1
	150-300	433.1	193.1
	350-400	434.1	194.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.842.1		230	76.83.37.101.1
813	76.80.60.844.1		255	76.83.37.102.1
1219	76.80.60.846.1		305	76.83.37.103.1
1524	76.80.60.848.1		355	76.83.37.105.1
1829	76.80.60.850.1		405	76.83.37.106.1
2134	76.80.60.852.1		455	76.83.37.107.1
2438	76.80.60.854.1			
2743	76.80.60.856.1			
3048	76.80.60.858.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	96.330.1	15	4	3/4	* 110	96.330.1
20	4	3/4	* 110	96.330.1	20	4	3/4	* 120	96.332.1
25	4	7/8	* 130	96.403.1	25	4	7/8	* 130	96.403.1
40	4	1	* 140	96.469.1	40	4	1	* 140	96.469.1
50	8	7/8	* 150	96.406.1					
80	8	7/8	* 150	96.406.1					
100	8	1 1/8	* 170	96.532.1					
150	12	1 1/8	* 190	96.535.1					
200	12	1 3/8	* 220	96.643.1					
250	16	1 3/8	* 240	96.646.1					
300	20	1 3/8	* 250	96.647.1					
350	20	1 1/2	* 280	96.693.1					
400	20	1 5/8	* 290	96.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	96.332.1
					20	4	3/4	* 130	96.334.1
					25	4	7/8	* 140	96.404.1
					40	4	1	* 160	96.472.1
50	8	7/8	* 160	96.407.1	50	8	7/8	* 160	96.407.1
80	8	7/8	* 160	96.407.1	80	8	7/8	* 170	96.409.1
100	8	1 1/8	* 180	96.533.1	100	8	1 1/8	* 200	96.542.1
150	12	1 1/8	* 210	96.538.1	150	12	1 1/8	* 230	96.541.1
200	12	1 3/8	* 240	96.646.1	200	12	1 3/8	* 270	96.650.1
250	16	1 3/8	* 250	96.647.1	250	16	1 3/8	* 290	96.654.1
300	20	1 3/8	* 280	96.652.1	300	20	1 3/8	* 310	96.656.1
350	20	1 1/2	* 300	96.696.1	350	20	1 1/2	* 350	96.704.1
400	20	1 5/8	* 310	96.727.1	400	20	1 5/8	* 360	96.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.60.203.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.576.1	

* DRAIN POINT	DN 20	FIG.0J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.60.204.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.578.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.60.204.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.60.203.1	
LAP-JOINT FLANGE	2	76.64.20.258.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	
	8	81.38.96.330.1	
WELDING NECK FLANGE	2	76.64.79.576.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.60.203.1	
LAP-JOINT FLANGE	1	76.64.20.258.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.576.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.60.203.1	
LAP-JOINT FLANGE	1	76.64.20.258.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
	4	81.38.96.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.60.203.1	
LAP-JOINT FLANGE	2	76.64.20.258.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	
	8	81.38.96.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.987.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.96.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.987.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.96.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.33.60.203.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.576.1	

* VENT POINT	DN 20	FIG.1J	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.33.60.204.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.578.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.33.60.204.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	

CLASS 92020

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -400	155.1	155.1	154.1	149.1	143.1	138.1	128.1	120.7	109.7	101.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	E	A						
50	C	C	C	C	B	A							
40	C	B	B	B	A								
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	120
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 92020	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	---	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GABB	GATE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLBB	GLOBE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION		MESC													

* PIPE															
PIPE		74.33.11	021.1	029.1	037.1	053.1	061.1	069.1	078.1	087.1	099.1	111.1	123.1	134.1	144.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1									
* FLANGES															
BLIND FLANGE		76.64.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1
SPECTACLE BLIND FLANGE		76.88.07	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1	534.1	536.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	358.1	362.1	366.1	368.1	370.1	372.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1
WELDING NECK FLANGE		76.64.79	576.1	578.1	580.1	582.1	584.1	496.1	538.1	540.1	542.1	544.1	546.1	548.1	550.1
* FITTINGS															
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	417.1	427.1	439.1	449.1	459.1	469.1	479.1	489.1	499.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
* VALVES															
CHECK VALVE BUTT-WELD ENDS		77.14.74	153.1	154.1	155.1	157.1	158.1	160.1	163.1	164.1	165.1	166.1	167.1	168.1	169.1
GATE VALVE BW BELLOWS SEALED		77.24.64	853.1	854.1	855.1	857.1									
GATE VALVE BUTT-WELD ENDS		77.24.74	153.1	154.1	155.1	157.1	158.1	160.1	163.1	164.1	165.1	166.1	167.1	168.1	169.1
GATE VALVE FLANGED		77.23.64	853.1	854.1	855.1	857.1	858.1								
GLOBE VALVE BW BELLOWS SEALED		77.34.64	853.1	854.1	855.1	857.1									
GLOBE VALVE BUTT-WELD ENDS		77.34.74	153.1	154.1	155.1	157.1	158.1	160.1	163.1	164.1					
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1
METER RUN		76.64.95	162.1	164.1	166.1	168.1									
ORIFICE FLANGE SET		76.64.91					584.1	496.1	538.1	540.1	542.1	544.1	546.1	548.1	550.1

		BROB	RECB	REEB	TERB			BROB	RECB	REEB			BNIP
		76.	76.	76.	76.			76.	76.	76.			76.80.31
RUN*	BR								BRANCH RUN-PIPE				
20*	15		32.68.002.1	32.69.002.1	32.86.003.1	400*	50	79.26.368.1			15	40-150	181.1
25*	15		32.68.012.1	32.69.012.1	32.86.011.1	400*	80	79.26.392.1				200-400	182.1
25*	20		32.68.022.1	32.69.022.1	32.86.019.1	400*	100	79.26.680.1			20	40- 80	183.1
40*	15		32.68.032.1	32.69.032.1		400*	150	79.26.700.1	32.68.349.1	32.69.349.1		100-400	184.1
40*	20		32.68.042.1	32.69.042.1		400*	200	79.26.718.1	32.68.353.1	32.69.353.1	25	40- 40	185.1
40*	25		32.68.052.1	32.69.052.1		400*	250	79.26.734.1	32.68.363.1	32.69.363.1		50- 50	186.1
50*	20		32.68.066.1	32.69.066.1		400*	300	79.26.748.1	32.68.373.1	32.69.373.1		80-100	187.1
50*	25		32.68.072.1	32.69.072.1		400*	350	79.26.760.1	32.68.383.1	32.69.383.1		150-400	188.1
50*	40		32.68.082.1	32.69.082.1							40	50- 50	189.1
80*	40		32.68.092.1	32.69.092.1								80- 80	190.1
80*	50	79.25.360.1	32.68.102.1	32.69.102.1								100-100	191.1
100*	50	79.26.356.1	32.68.131.1	32.69.131.1								150-300	193.1
100*	80	79.26.380.1	32.68.146.1	32.69.146.1								350-400	194.1
150*	50	79.26.358.1											
150*	80	79.26.382.1	32.68.161.1	32.69.161.1									
150*	100	79.26.670.1	32.68.172.1	32.69.172.1									
200*	50	79.26.360.1											
200*	80	79.26.384.1											
200*	100	79.26.672.1	32.68.192.1	32.69.192.1									
200*	150	79.26.692.1	32.68.217.1	32.69.217.1									
250*	50	79.26.362.1											
250*	80	79.26.386.1											
250*	100	79.26.674.1											
250*	150	79.26.694.1	32.68.257.1	32.69.257.1									
250*	200	79.26.712.1	32.68.273.1	32.69.273.1									
300*	50	79.26.364.1											
300*	80	79.26.388.1											
300*	100	79.26.676.1											
300*	150	79.26.696.1	32.68.283.1	32.69.283.1									
300*	200	79.26.714.1	32.68.293.1	32.69.293.1									
300*	250	79.26.730.1	32.68.303.1	32.69.303.1									
350*	50	79.26.366.1											
350*	80	79.26.390.1											
350*	100	79.26.678.1											
350*	150	79.26.698.1	32.68.313.1	32.69.313.1									
350*	200	79.26.716.1	32.68.323.1	32.69.323.1									
350*	250	79.26.732.1	32.68.333.1	32.69.333.1									
350*	300	79.26.746.1	32.68.343.1	32.69.343.1									

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	DESCRIPTION
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	96.330.1	15	4	3/4	* 110	96.330.1
20	4	3/4	* 110	96.330.1	20	4	3/4	* 120	96.332.1
25	4	7/8	* 130	96.403.1	25	4	7/8	* 130	96.403.1
40	4	1	* 140	96.469.1	40	4	1	* 140	96.469.1
50	8	7/8	* 150	96.406.1					
80	8	7/8	* 150	96.406.1					
100	8	1 1/8	* 170	96.532.1					
150	12	1 1/8	* 190	96.535.1					
200	12	1 3/8	* 220	96.643.1					
250	16	1 3/8	* 240	96.646.1					
300	20	1 3/8	* 250	96.647.1					
350	20	1 1/2	* 280	96.693.1					
400	20	1 5/8	* 290	96.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	96.332.1
					20	4	3/4	* 130	96.334.1
					25	4	7/8	* 140	96.404.1
					40	4	1	* 160	96.472.1
50	8	7/8	* 160	96.407.1	50	8	7/8	* 160	96.407.1
80	8	7/8	* 160	96.407.1	80	8	7/8	* 170	96.409.1
100	8	1 1/8	* 180	96.533.1	100	8	1 1/8	* 200	96.542.1
150	12	1 1/8	* 210	96.538.1	150	12	1 1/8	* 230	96.541.1
200	12	1 3/8	* 240	96.646.1	200	12	1 3/8	* 270	96.650.1
250	16	1 3/8	* 250	96.647.1	250	16	1 3/8	* 290	96.654.1
300	20	1 3/8	* 280	96.652.1	300	20	1 3/8	* 310	96.656.1
350	20	1 1/2	* 300	96.696.1	350	20	1 1/2	* 350	96.704.1
400	20	1 5/8	* 310	96.727.1	400	20	1 5/8	* 360	96.736.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.408.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.74.153.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.576.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.74.154.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.578.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.74.154.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.578.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	2	77.24.74.153.1	
LAP-JOINT FLANGE	2	76.64.20.258.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	2	76.64.79.576.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.74.153.1	
LAP-JOINT FLANGE	1	76.64.20.258.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.576.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.74.153.1	
LAP-JOINT FLANGE	1	76.64.20.258.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.576.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.64.853.1	
LAP-JOINT FLANGE	2	76.64.20.258.1	
STUD BOLT WITH NUTS	8	81.38.96.330.1	
	8	81.38.96.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.987.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.96.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.987.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.96.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.408.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.74.153.1	
PIPE NIPPLE 50MM	1	76.32.57.431.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.576.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.74.154.1	
PIPE NIPPLE 50MM	1	76.32.57.441.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.578.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.74.154.1	
STUD BOLT WITH NUTS	4	81.38.96.330.1	
WELDING NECK FLANGE	1	76.64.79.578.1	

CLASS 92110

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400

		PRESSURE BAR GA								
DN15	-400	155.1	155.1	154.1	149.1	143.1	138.1	128.6	120.7	109.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	A							
50	C	C	C	C	B	A							
40	C	B	B	A									
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	120
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 92110	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 92110, REV.C PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 92110, REV.C PAGE 3
 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE															
PIPE		74.33.11	021.1	029.1	037.1	053.1	061.1	069.1	078.1	087.1	099.1	111.1	123.1	134.1	144.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1									
* FLANGES															
BLIND FLANGE		76.64.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1
SPECTACLE BLIND FLANGE		76.88.07	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1	534.1	536.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	358.1	362.1	366.1	368.1	370.1	372.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1
WELDING NECK FLANGE		76.64.79	576.1	578.1	580.1	582.1	584.1	496.1	538.1	540.1	542.1	544.1	546.1	548.1	550.1
* FITTINGS															
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	417.1	427.1	439.1	449.1	459.1	469.1	479.1	489.1	499.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
* VALVES															
CHECK VALVE BUTT-WELD ENDS		77.14.75	153.1	154.1	155.1	157.1	158.1	170.1	173.1	174.1	175.1	176.1	177.1	178.1	179.1
GATE VALVE BUTT-WELD ENDS		77.24.75	553.1	554.1	555.1	557.1	558.1	560.1	563.1	564.1	565.1	566.1	567.1	568.1	569.1
GATE VALVE FLANGED		77.23.75	503.1	504.1	505.1	507.1	508.1								
GLOBE VALVE BUTT-WELD ENDS		77.34.75	253.1	254.1	255.1	257.1	258.1	170.1	173.1	174.1					
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1
METER RUN		76.64.95	162.1	164.1	166.1	168.1									
ORIFICE FLANGE SET		76.64.91					584.1	496.1	538.1	540.1	542.1	544.1	546.1	548.1	550.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB
	76.	76.	76.	76.		76.	76.	76.
RUN* BR	.							
20* 15		32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.26.368.1		
25* 15		32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.26.392.1		
25* 20		32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.26.680.1		
40* 15		32.68.032.1	32.69.032.1		400*150	79.26.700.1	32.68.349.1	32.69.349.1
40* 20		32.68.042.1	32.69.042.1		400*200	79.26.718.1	32.68.353.1	32.69.353.1
40* 25		32.68.052.1	32.69.052.1		400*250	79.26.734.1	32.68.363.1	32.69.363.1
50* 20		32.68.066.1	32.69.066.1		400*300	79.26.748.1	32.68.373.1	32.69.373.1
50* 25		32.68.072.1	32.69.072.1		400*350	79.26.760.1	32.68.383.1	32.69.383.1
50* 40		32.68.082.1	32.69.082.1					
80* 40		32.68.092.1	32.69.092.1					
80* 50	79.25.360.1	32.68.102.1	32.69.102.1					
100* 50	79.26.356.1	32.68.131.1	32.69.131.1					
100* 80	79.26.380.1	32.68.146.1	32.69.146.1					
150* 50	79.26.358.1							
150* 80	79.26.382.1	32.68.161.1	32.69.161.1					
150*100	79.26.670.1	32.68.172.1	32.69.172.1					
200* 50	79.26.360.1							
200* 80	79.26.384.1							
200*100	79.26.672.1	32.68.192.1	32.69.192.1					
200*150	79.26.692.1	32.68.217.1	32.69.217.1					
250* 50	79.26.362.1							
250* 80	79.26.386.1							
250*100	79.26.674.1							
250*150	79.26.694.1	32.68.257.1	32.69.257.1					
250*200	79.26.712.1	32.68.273.1	32.69.273.1					
300* 50	79.26.364.1							
300* 80	79.26.388.1							
300*100	79.26.676.1							
300*150	79.26.696.1	32.68.283.1	32.69.283.1					
300*200	79.26.714.1	32.68.293.1	32.69.293.1					
300*250	79.26.730.1	32.68.303.1	32.69.303.1					
350* 50	79.26.366.1							
350* 80	79.26.390.1							
350*100	79.26.678.1							
350*150	79.26.698.1	32.68.313.1	32.69.313.1					
350*200	79.26.716.1	32.68.323.1	32.69.323.1					
350*250	79.26.732.1	32.68.333.1	32.69.333.1					
350*300	79.26.746.1	32.68.343.1	32.69.343.1					

		BNIF	BNIP
		76.80.38	76.80.31
BRANCH	RUN-PIPE		
15	40-150	421.1	181.1
	200-400	422.1	182.1
20	40- 80	423.1	183.1
	100-400	424.1	184.1
25	40- 40	425.1	185.1
	50- 50	426.1	186.1
	80-100	427.1	187.1
	150-400	428.1	188.1
40	50- 50	430.1	189.1
	80- 80	431.1	190.1
	100-100	432.1	191.1
	150-300	433.1	193.1
	350-400	434.1	194.1

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	3/4	* 110	15	4	3/4	* 110
20	4	3/4	* 110	20	4	3/4	* 120
25	4	7/8	* 130	25	4	7/8	* 130
40	4	1	* 140	40	4	1	* 140
50	8	7/8	* 150				
80	8	7/8	* 150				
100	8	1 1/8	* 170				
150	12	1 1/8	* 190				
200	12	1 3/8	* 220				
250	16	1 3/8	* 240				
300	20	1 3/8	* 250				
350	20	1 1/2	* 280				
400	20	1 5/8	* 290				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	3/4	* 120
				20	4	3/4	* 130
				25	4	7/8	* 140
				40	4	1	* 160
50	8	7/8	* 160	50	8	7/8	* 160
80	8	7/8	* 160	80	8	7/8	* 170
100	8	1 1/8	* 180	100	8	1 1/8	* 200
150	12	1 1/8	* 210	150	12	1 1/8	* 230
200	12	1 3/8	* 240	200	12	1 3/8	* 270
250	16	1 3/8	* 250	250	16	1 3/8	* 290
300	20	1 3/8	* 280	300	20	1 3/8	* 310
350	20	1 1/2	* 300	350	20	1 1/2	* 350
400	20	1 5/8	* 310	400	20	1 5/8	* 360

ASSEMBLIES

* DRAIN POINT				DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.408.1	
GASKET, SPIRAL WOUND				1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.75.553.1	
PIPE NIPPLE 50MM				1	76.32.57.431.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				1	76.64.79.576.1	

* DRAIN POINT				DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.412.1	
GASKET, SPIRAL WOUND				1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.75.554.1	
PIPE NIPPLE 50MM				1	76.32.57.441.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				1	76.64.79.578.1	

* DRAIN POINT				DN 20	FIG.0M	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.412.1	
GASKET, SPIRAL WOUND				1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.75.554.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				1	76.64.79.578.1	

* ORIFICE INSTR.CONN.				DN 15	FIG.0M	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, SPIRAL WOUND				2	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS				2	77.24.75.553.1	
LAP-JOINT FLANGE				2	76.64.20.258.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				2	76.64.79.576.1	

* PRESSURE INSTR.CONN.				DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, SPIRAL WOUND				1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.75.553.1	
LAP-JOINT FLANGE				1	76.64.20.258.1	
PIPE NIPPLE 50MM				1	76.32.57.431.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				1	76.64.79.576.1	

* PRESSURE INSTR.CONN.				DN 15	FIG.0M	DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, SPIRAL WOUND				1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS				1	77.24.75.553.1	
LAP-JOINT FLANGE				1	76.64.20.258.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				1	76.64.79.576.1	

* METERRUN INSTR. CONN				DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
GASKET, SPIRAL WOUND				4	85.41.46.504.1	
GATE VALVE FLANGED				2	77.23.75.503.1	
LAP-JOINT FLANGE				2	76.64.20.258.1	
STUD BOLT WITH NUTS				8	81.38.61.330.1	
				8	81.38.61.330.1	

* TEMPERATURE INSTR.C.				DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE				1	76.64.60.987.1	
GASKET, SPIRAL WOUND				1	85.41.46.512.1	
STUD BOLT WITH NUTS				4	81.38.61.472.1	
THERMOWELL STRAIGHT L=230 MM				1	76.83.37.101.1	

* TEMPERATURE INSTR.C.				DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE				1	76.64.60.987.1	
GASKET, SPIRAL WOUND				1	85.41.46.512.1	
STUD BOLT WITH NUTS				4	81.38.61.472.1	
THERMOWELL STRAIGHT L=255 MM				1	76.83.37.102.1	

* VENT POINT				DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.408.1	
GASKET, SPIRAL WOUND				1	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS				1	77.34.75.253.1	
PIPE NIPPLE 50MM				1	76.32.57.431.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				1	76.64.79.576.1	

* VENT POINT				DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.412.1	
GASKET, SPIRAL WOUND				1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS				1	77.34.75.254.1	
PIPE NIPPLE 50MM				1	76.32.57.441.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				1	76.64.79.578.1	

* VENT POINT				DN 20	FIG.1M	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1	(PIPING COMP.)	
BLIND FLANGE				1	76.64.10.412.1	
GASKET, SPIRAL WOUND				1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS				1	77.34.75.254.1	
STUD BOLT WITH NUTS				4	81.38.61.330.1	
WELDING NECK FLANGE				1	76.64.79.578.1	

CLASS 92120

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	450	500

	PRESSURE BAR GA										
DN15 -400	155.1	155.1	154.1	149.1	143.1	138.1	128.6	120.7	109.7	101.3	83.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
350	C	C	C	C	E	E	E	E	E	E	E	E	A		
300	C	C	C	C	E	E	E	E	E	E	E	A			
250	C	C	C	C	E	E	E	E	E	E	A				
200	C	C	C	C	E	E	E	E	A						
150	C	C	C	C	E	E	E	A							
100	C	C	C	C	E	E	A								
80	C	C	C	C	E	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
15	80
20	80
25	80
40	80
50	80
80	80
100	120
150	120
200	120
250	120
300	120
350	120
400	120

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 92120	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 92120, REV.B PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/194-8C
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 92120, REV.B PAGE 3
ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE															
PIPE		74.33.11	021.1	029.1	037.1	053.1	061.1	069.1	078.1	087.1	099.1	111.1	123.1	134.1	144.1
PIPE NIPPLE 50MM		76.32.57	431.1	441.1	451.1	471.1									
* FLANGES															
BLIND FLANGE		76.64.10	408.1	412.1	416.1	418.1	420.1	322.1	324.1	326.1	328.1	330.1	332.1	334.1	336.1
SPECTACLE BLIND FLANGE		76.88.07	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1	534.1	536.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	358.1	362.1	366.1	368.1	370.1	372.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1
WELDING NECK FLANGE		76.64.79	576.1	578.1	580.1	582.1	584.1	496.1	538.1	540.1	542.1	544.1	546.1	548.1	550.1
* FITTINGS															
CAP BUTT-WELD.END		76.32.18	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	377.1	387.1	397.1	407.1	417.1	427.1	439.1	449.1	459.1	469.1	479.1	489.1	499.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	010.1	015.1	019.1	027.1	037.1	047.1	059.1	069.1	079.1	089.1	099.1	109.1	119.1
* VALVES															
CHECK VALVE BUTT-WELD ENDS		77.14.75	153.1	154.1	155.1	157.1	158.1	170.1	173.1	174.1	175.1	176.1	177.1	178.1	179.1
GATE VALVE BUTT-WELD ENDS		77.24.75	553.1	554.1	555.1	557.1	558.1	560.1	563.1	564.1	565.1	566.1	567.1	568.1	569.1
GATE VALVE FLANGED		77.23.75	503.1	504.1	505.1	507.1	508.1								
GLOBE VALVE BUTT-WELD ENDS		77.34.75	253.1	254.1	255.1	257.1	258.1	170.1	173.1	174.1					
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1	482.1	484.1
METER RUN		76.64.95	162.1	164.1	166.1	168.1									
ORIFICE FLANGE SET		76.64.91					584.1	496.1	538.1	540.1	542.1	544.1	546.1	548.1	550.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB
	76.	76.	76.	76.		76.	76.	76.
RUN* BR	.							
20* 15		32.68.002.1	32.69.002.1	32.86.003.1	400* 50	79.26.368.1		
25* 15		32.68.012.1	32.69.012.1	32.86.011.1	400* 80	79.26.392.1		
25* 20		32.68.022.1	32.69.022.1	32.86.019.1	400*100	79.26.680.1		
40* 15		32.68.032.1	32.69.032.1		400*150	79.26.700.1	32.68.349.1	32.69.349.1
40* 20		32.68.042.1	32.69.042.1		400*200	79.26.718.1	32.68.353.1	32.69.353.1
40* 25		32.68.052.1	32.69.052.1		400*250	79.26.734.1	32.68.363.1	32.69.363.1
50* 20		32.68.066.1	32.69.066.1		400*300	79.26.748.1	32.68.373.1	32.69.373.1
50* 25		32.68.072.1	32.69.072.1		400*350	79.26.760.1	32.68.383.1	32.69.383.1
50* 40		32.68.082.1	32.69.082.1					
80* 40		32.68.092.1	32.69.092.1					
80* 50	79.25.360.1	32.68.102.1	32.69.102.1					
100* 50	79.26.356.1	32.68.131.1	32.69.131.1					
100* 80	79.26.380.1	32.68.146.1	32.69.146.1					
150* 50	79.26.358.1							
150* 80	79.26.382.1	32.68.161.1	32.69.161.1					
150*100	79.26.670.1	32.68.172.1	32.69.172.1					
200* 50	79.26.360.1							
200* 80	79.26.384.1							
200*100	79.26.672.1	32.68.192.1	32.69.192.1					
200*150	79.26.692.1	32.68.217.1	32.69.217.1					
250* 50	79.26.362.1							
250* 80	79.26.386.1							
250*100	79.26.674.1							
250*150	79.26.694.1	32.68.257.1	32.69.257.1					
250*200	79.26.712.1	32.68.273.1	32.69.273.1					
300* 50	79.26.364.1							
300* 80	79.26.388.1							
300*100	79.26.676.1							
300*150	79.26.696.1	32.68.283.1	32.69.283.1					
300*200	79.26.714.1	32.68.293.1	32.69.293.1					
300*250	79.26.730.1	32.68.303.1	32.69.303.1					
350* 50	79.26.366.1							
350* 80	79.26.390.1							
350*100	79.26.678.1							
350*150	79.26.698.1	32.68.313.1	32.69.313.1					
350*200	79.26.716.1	32.68.323.1	32.69.323.1					
350*250	79.26.732.1	32.68.333.1	32.69.333.1					
350*300	79.26.746.1	32.68.343.1	32.69.343.1					

		BNIF	BNIP
		76.80.38	76.80.31
BRANCH	RUN-PIPE		
15	40-150	421.1	181.1
	200-400	422.1	182.1
20	40- 80	423.1	183.1
	100-400	424.1	184.1
25	40- 40	425.1	185.1
	50- 50	426.1	186.1
	80-100	427.1	187.1
	150-400	428.1	188.1
40	50- 50	430.1	189.1
	80- 80	431.1	190.1
	100-100	432.1	191.1
	150-300	433.1	193.1
	350-400	434.1	194.1

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.37.101.1
255	76.83.37.102.1
305	76.83.37.103.1
355	76.83.37.105.1
405	76.83.37.106.1
455	76.83.37.107.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	97.330.1	15	4	3/4	* 110	97.330.1
20	4	3/4	* 110	97.330.1	20	4	3/4	* 120	97.332.1
25	4	7/8	* 130	97.403.1	25	4	7/8	* 130	97.403.1
40	4	1	* 140	97.469.1	40	4	1	* 140	97.469.1
50	8	7/8	* 150	97.406.1					
80	8	7/8	* 150	97.406.1					
100	8	1 1/8	* 170	97.532.1					
150	12	1 1/8	* 190	97.535.1					
200	12	1 3/8	* 220	97.643.1					
250	16	1 3/8	* 240	97.646.1					
300	20	1 3/8	* 250	97.647.1					
350	20	1 1/2	* 280	97.693.1					
400	20	1 5/8	* 290	97.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	97.332.1
					20	4	3/4	* 130	97.334.1
					25	4	7/8	* 140	97.404.1
					40	4	1	* 160	97.472.1
50	8	7/8	* 160	97.407.1	50	8	7/8	* 160	97.407.1
80	8	7/8	* 160	97.407.1	80	8	7/8	* 170	97.409.1
100	8	1 1/8	* 180	97.533.1	100	8	1 1/8	* 200	97.542.1
150	12	1 1/8	* 210	97.538.1	150	12	1 1/8	* 230	97.541.1
200	12	1 3/8	* 240	97.646.1	200	12	1 3/8	* 270	97.657.1
250	16	1 3/8	* 250	97.647.1	250	16	1 3/8	* 290	97.654.1
300	20	1 3/8	* 280	97.652.1	300	20	1 3/8	* 310	97.656.1
350	20	1 1/2	* 300	97.696.1	350	20	1 1/2	* 350	97.704.1
400	20	1 5/8	* 310	97.727.1	400	20	1 5/8	* 360	97.736.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.64.10.408.1		
GASKET, SPIRAL WOUND	1	85.41.46.504.1		
GATE VALVE BUTT-WELD ENDS	1	77.24.75.553.1		
PIPE NIPPLE 50MM	1	76.32.57.431.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	1	76.64.79.576.1		

* DRAIN POINT DN 20 FIG.0N DN 40 - 40				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.64.10.412.1		
GASKET, SPIRAL WOUND	1	85.41.46.506.1		
GATE VALVE BUTT-WELD ENDS	1	77.24.75.554.1		
PIPE NIPPLE 50MM	1	76.32.57.441.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	1	76.64.79.578.1		

* DRAIN POINT DN 20 FIG.0M DN 50 -400				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.64.10.412.1		
GASKET, SPIRAL WOUND	1	85.41.46.506.1		
GATE VALVE BUTT-WELD ENDS	1	77.24.75.554.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	1	76.64.79.578.1		

* ORIFICE INSTR.CONN. DN 15 FIG.0M DN 50 -400				
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	2	85.41.46.504.1		
GATE VALVE BUTT-WELD ENDS	2	77.24.75.553.1		
LAP-JOINT FLANGE	2	76.64.20.258.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	2	76.64.79.576.1		

* PRESSURE INSTR.CONN. DN 15 FIG.0N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	1	85.41.46.504.1		
GATE VALVE BUTT-WELD ENDS	1	77.24.75.553.1		
LAP-JOINT FLANGE	1	76.64.20.258.1		
PIPE NIPPLE 50MM	1	76.32.57.431.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	1	76.64.79.576.1		

* PRESSURE INSTR.CONN. DN 15 FIG.0M DN 40 -400				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	1	85.41.46.504.1		
GATE VALVE BUTT-WELD ENDS	1	77.24.75.553.1		
LAP-JOINT FLANGE	1	76.64.20.258.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	1	76.64.79.576.1		

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40				
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
GASKET, SPIRAL WOUND	4	85.41.46.504.1		
GATE VALVE FLANGED	2	77.23.75.503.1		
LAP-JOINT FLANGE	2	76.64.20.258.1		
STUD BOLT WITH NUTS	8	81.38.97.330.1		
	8	81.38.97.330.1		

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.987.1		
GASKET, SPIRAL WOUND	1	85.41.46.512.1		
STUD BOLT WITH NUTS	4	81.38.97.472.1		
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1		

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -400				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
COVER FLANGE THERMOWELL NOZZLE	1	76.64.60.987.1		
GASKET, SPIRAL WOUND	1	85.41.46.512.1		
STUD BOLT WITH NUTS	4	81.38.97.472.1		
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1		

* VENT POINT DN 15 FIG.1N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.64.10.408.1		
GASKET, SPIRAL WOUND	1	85.41.46.504.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.34.75.253.1		
PIPE NIPPLE 50MM	1	76.32.57.431.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	1	76.64.79.576.1		

* VENT POINT DN 20 FIG.1N DN 40 - 40				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.64.10.412.1		
GASKET, SPIRAL WOUND	1	85.41.46.506.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.34.75.254.1		
PIPE NIPPLE 50MM	1	76.32.57.441.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	1	76.64.79.578.1		

* VENT POINT DN 20 FIG.1M DN 50 -600				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.64.10.412.1		
GASKET, SPIRAL WOUND	1	85.41.46.506.1		
GLOBE VALVE BUTT-WELD ENDS	1	77.34.75.254.1		
STUD BOLT WITH NUTS	4	81.38.97.330.1		
WELDING NECK FLANGE	1	76.64.79.578.1		

CLASS 93021

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400

PRESSURE BAR GA									
DN15 -150	137.6	137.6	126.7	115.6	106.9	100.2	94.9	91.1	88.2

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150

150	C	C	C	C	E	E	E	A
100	C	C	C	C	E	E	A	
80	C	C	C	C	E	A		
50	C	C	C	B	A			
40	C	B	B	A				
25	B	B	A					
20	B	A						
15	A							

TABLE OF SCHEDULES

DN	SCHEDULE

15	40S
20	40S
25	40S
40	40S
50	80S
80	80S
100	80S
150	80S

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 316	PLANT :	
CLASS NO. : 93021	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-150	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-150	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-150	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-150	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-150	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-150	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-150	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A403-WP316L

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-150	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP316
MTRR	METER RUN	DN 15- 40	AISI 316
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE								
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150

* PIPE										
PIPE		74.36.33	018.1	026.1	034.1	050.1	060.1	068.1	076.1	085.1
PIPE NIPPLE 50MM		76.33.57	931.1	941.1	951.1	971.1				
* FLANGES										
BLIND FLANGE		76.65.10	500.1	501.1	502.1	503.1	504.1	489.1	490.1	491.1
SPECTACLE BLIND FLANGE		76.88.10	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	558.1	562.1	566.1	568.1	570.1	572.1	574.1	576.1
WELDING NECK FLANGE		76.65.80	582.1	584.1	586.1	588.1	609.1	572.1	574.1	576.1
* FITTINGS										
CAP BUTT-WELD.END		76.33.19	286.1	296.1	306.1	326.1	338.1	358.1	378.1	397.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	286.1	296.1	306.1	326.1	338.1	358.1	378.1	397.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	286.1	296.1	306.1	326.1	338.1	358.1	378.1	397.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	786.1	796.1	806.1	826.1	838.1	858.1	878.1	897.1
* VALVES										
CHECK VALVE FLANGED		77.13.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1
GATE VALVE FLANGED		77.23.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1
GLOBE VALVE FLANGED		77.33.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1
* MISCELLANEOUS										
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1
METER RUN		76.65.96	432.1	434.1	436.1	438.1				
ORIFICE FLANGE SET		76.65.92					570.1	572.1	574.1	576.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.566.1	33.72.566.1	33.85.618.1
25* 15		33.70.576.1	33.72.576.1	33.85.628.1
25* 20		33.70.586.1	33.72.586.1	33.85.638.1
40* 15		33.70.596.1	33.72.596.1	33.85.642.1
40* 20		33.70.616.1	33.72.616.1	33.85.648.1
40* 25		33.70.626.1	33.72.626.1	33.85.658.1
50* 20		36.50.102.1	36.63.102.1	33.85.667.1
50* 25		33.70.641.1	33.72.641.1	33.85.677.1
50* 40		33.70.651.1	33.72.651.1	33.85.687.1
80* 40		33.70.681.1	33.72.681.1	33.85.697.1
80* 50	79.70.360.1	33.70.688.1	33.72.688.1	33.89.356.1
100* 40		33.70.701.1	33.72.701.1	33.89.367.1
100* 50	79.70.362.1	33.70.708.1	33.72.708.1	33.89.372.1
100* 80	79.70.386.1	33.70.718.1	33.72.718.1	33.89.380.1
150* 50	79.70.364.1			
150* 80	79.70.388.1	33.70.748.1	33.72.748.1	33.89.388.1
150*100	79.70.410.1	33.70.758.1	33.72.758.1	33.89.396.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE		
15	40-150	121.1	451.1
20	40- 80	123.1	453.1
	100-150	124.1	454.1
25	40- 40	125.1	455.1
	50- 50	126.1	456.1
	80-100	127.1	457.1
	150-150	128.1	458.1
40	50- 50	130.1	459.1
	80- 80	131.1	460.1
	100-100	132.1	461.1
	150-150	133.1	462.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.61.502.1			230 76.83.37.101.1
813	76.80.61.504.1			255 76.83.37.102.1
1219	76.80.61.506.1			305 76.83.37.103.1
1524	76.80.61.508.1			355 76.83.37.105.1
1829	76.80.61.510.1			405 76.83.37.106.1
2134	76.80.61.512.1			455 76.83.37.107.1
2438	76.80.61.514.1			
2743	76.80.61.516.1			
3048	76.80.61.518.1			

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 110	61.330.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	7/8	* 150	61.406.1					
100	8	1 1/8	* 170	61.532.1					
150	12	1 1/8	* 190	61.535.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 160	61.407.1
80	8	7/8	* 160	61.407.1	80	8	7/8	* 170	61.409.1
100	8	1 1/8	* 180	61.533.1	100	8	1 1/8	* 200	61.525.1
150	12	1 1/8	* 210	61.538.1	150	12	1 1/8	* 230	61.541.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.500.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.03.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.65.80.582.1	

* DRAIN POINT	DN 20	FIG.0I	DN 40 - 40
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.501.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.03.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.65.80.584.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.501.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.03.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -200
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.03.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.65.80.582.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0J	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.03.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
PIPE NIPPLE 50MM	1	76.33.57.931.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.65.80.582.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.03.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
	4	81.38.61.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.03.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.500.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.33.03.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.65.80.582.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.501.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.33.03.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.65.80.584.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.501.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.33.03.204.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	

CLASS 93050

DESIGN LIMITS										
TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	450
PRESSURE BAR GA										
DN15 -100	146.4	143.6	132.1	122.8	114.8	107.8	102.3	98.2	94.7	92.5
DN150-150	137.6	137.6	132.1	122.8	114.8	107.8	102.3	98.2	94.7	92.5

- NOTES
- - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES									
BRANCHSIZE									
RUN SIZE	15	20	25	40	50	80	100	150	
150	C	C	C	C	E	E	E	A	
100	C	C	C	C	E	E	A		
80	C	C	C	C	E	A			
50	C	C	C	B	A				
40	C	B	B	A					
25	B	B	A						
20	B	A							
15	A								

TABLE OF SCHEDULES	
DN	SCHEDULE
15	40S
20	40S
25	40S
40	40S
50	40S
80	40S
100	80S
150	80S

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			
STAINL STEEL AISI 321/347	PLANT	:	
CLASS NO. : 93050	CONSIGNEE	:	
ANS RATING : CLASS 900	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : C	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	
ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-150	ASTM A312-TP321/347

* FLANGES

BLFL	BLIND FLANGE	DN 15-150	ASTM A182-F321/347
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F321/347
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F321/347
SBFL	SPECTACLE BLIND FLANGE	DN 15-150	ASTM A240-TP321/347
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-150	ASTM A240-TP321/347
WNFL	WELDING NECK FLANGE	DN 15-150	ASTM A182-F321/347

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-150	ASTM A403-WP321/347
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A403-WP321/347
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A403-WP321/347
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A403-WP321/347

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321/347
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321/347
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-150	ASTM A182-F321/347
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A403-WP321/347
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A403-WP321/347
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP321/347

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-150	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321/347
MTRR	METER RUN	DN 15- 40	AISI 321/347
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A182-F321/347
STBT	STUD BOLT WITH NUTS	---	ASTM A453-GR.660 CLASS A
TWSG	THERMOWELL STRAIGHT	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE								
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150

* PIPE										
PIPE		74.36.15	018.1	026.1	034.1	050.1	058.1	066.1	076.1	085.1
* FLANGES										
BLIND FLANGE		76.65.10	262.1	264.1	266.1	268.1	270.1	222.1	224.1	226.1
SPECTACLE BLIND FLANGE		76.88.09	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	858.1	862.1	866.1	868.1	870.1	872.1	874.1	876.1
WELDING NECK FLANGE		76.65.80	312.1	314.1	316.1	318.1	320.1	322.1	364.1	366.1
* FITTINGS										
CAP BUTT-WELD.END		76.33.18	036.1	046.1	056.1	076.1	086.1	106.1	128.1	147.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.38	036.1	046.1	056.1	076.1	086.1	106.1	128.1	147.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.39	536.1	546.1	556.1	576.1	586.1	606.1	628.1	647.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	036.1	046.1	056.1	076.1	086.1	106.1	128.1	147.1
* VALVES										
CHECK VALVE FLANGED		77.13.20	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1
GATE VALVE FLANGED		77.23.20	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1
GLOBE VALVE FLANGED		77.33.20	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1
* MISCELLANEOUS										
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1
METER RUN		76.65.96	832.1	834.1	836.1	838.1				
ORIFICE FLANGE SET		76.65.95					388.1	358.1	364.1	366.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.69.066.1	33.71.066.1	33.85.018.1
25* 15		33.69.076.1	33.71.076.1	33.85.028.1
25* 20		33.69.086.1	33.71.086.1	33.85.038.1
40* 15		33.69.096.1	33.71.096.1	33.85.042.1
40* 20		33.69.116.1	33.71.116.1	33.85.048.1
40* 25		33.69.126.1	33.71.126.1	33.85.058.1
50* 20		33.69.130.1	33.71.130.1	
50* 25		33.69.136.1	33.71.136.1	
50* 40		33.69.146.1	33.71.146.1	33.85.084.1
80* 40		33.69.176.1	33.71.176.1	
80* 50	79.73.634.1	33.69.186.1	33.71.186.1	
100* 40		33.69.195.1	33.71.195.1	
100* 50	79.74.182.1	33.69.207.1	33.71.207.1	
100* 80	79.74.204.1	33.69.217.1	33.71.217.1	
150* 50	79.74.184.1			
150* 80	79.74.206.1	33.69.246.1	33.71.246.1	
150*100	79.74.410.1	33.69.258.1	33.71.258.1	

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-150	621.1	476.1
20	40- 80	623.1	478.1
	100-150	624.1	479.1
25	40- 40	625.1	480.1
	50- 50	626.1	481.1
	80-100	627.1	482.1
	150-150	628.1	483.1
40	50- 50	630.1	484.1
	80- 80	631.1	485.1
	100-100	632.1	486.1
	150-150	633.1	487.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.61.902.1			230 76.83.37.101.1
813	76.80.61.904.1			255 76.83.37.102.1
1219	76.80.61.906.1			305 76.83.37.103.1
1524	76.80.61.908.1			355 76.83.37.105.1
1829	76.80.61.910.1			405 76.83.37.106.1
2134	76.80.61.912.1			455 76.83.37.107.1
2438	76.80.61.914.1			
2743	76.80.61.916.1			
3048	76.80.61.918.1			

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	74.330.1	15	4	3/4	* 110	74.330.1
20	4	3/4	* 110	74.330.1	20	4	3/4	* 120	74.332.1
25	4	7/8	* 130	74.403.1	25	4	7/8	* 130	74.403.1
40	4	1	* 140	74.469.1	40	4	1	* 140	74.469.1
50	8	7/8	* 150	74.406.1					
80	8	7/8	* 150	74.406.1					
100	8	1 1/8	* 170	74.532.1					
150	12	1 1/8	* 190	74.535.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	74.332.1
					20	4	3/4	* 130	74.334.1
					25	4	7/8	* 140	74.404.1
					40	4	1	* 160	74.472.1
50	8	7/8	* 160	74.407.1	50	8	7/8	* 160	74.407.1
80	8	7/8	* 160	74.407.1	80	8	7/8	* 170	74.409.1
100	8	1 1/8	* 180	74.533.1	100	8	1 1/8	* 200	74.528.1
150	12	1 1/8	* 210	74.538.1	150	12	1 1/8	* 230	74.541.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.262.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.20.203.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.80.312.1	

* DRAIN POINT	DN 20	FIG.0I	DN 40 - 40
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.264.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.20.204.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.80.314.1	

* DRAIN POINT	DN 20	FIG.0H	DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.264.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.20.204.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -150
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.20.203.1	
LAP-JOINT FLANGE	2	76.65.20.608.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
WELDING NECK FLANGE	2	76.65.80.312.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.20.203.1	
LAP-JOINT FLANGE	1	76.65.20.608.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	4	81.38.74.330.1	
	1	76.65.80.312.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0H	DN 40 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.20.203.1	
LAP-JOINT FLANGE	1	76.65.20.608.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
	4	81.38.74.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.20.203.1	
LAP-JOINT FLANGE	2	76.65.20.608.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
	8	81.38.74.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.687.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.74.472.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.37.101.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.687.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.74.472.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.102.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.262.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.33.20.203.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.80.312.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.264.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.33.20.204.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.80.314.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.264.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.33.20.204.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	

CLASS 93055

DESIGN LIMITS											
TEMPERATURE IN DEGREES CELSIUS											
	0	50	100	150	200	250	300	350	450	500	538
PRESSURE BAR GA											
DN15 -100	146.4	143.6	132.1	122.8	114.8	107.8	102.3	98.2	92.5	84.0	73.7
DN150-300	137.6	137.6	132.1	122.8	114.8	107.8	102.3	98.2	92.5	84.0	73.7

- NOTES
- -----
 - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES												
RUN SIZE	BRANCH SIZE											
	15	20	25	40	50	80	100	150	200	250	300	
300	C	C	C	C	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	B	B	B	A		
200	C	C	C	C	E	E	B	B	A			
150	C	C	C	C	E	B	B	A				
100	C	C	C	C	B	B	A					
80	C	C	C	C	B	A						
50	C	C	C	B	A							
40	C	B	B	A								
25	B	B	A									
20	B	A										
15	A											

TABLE OF SCHEDULES	
DN	SCHEDULE
15	40S
20	40S
25	40S
40	40S
50	40S
80	40S
100	80S
150	80S
200	100
250	100
300	100

CODE	EXPLANATION OF CHARACTERS
----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			
STAINL STEEL AISI 321 STAB HT	PLANT	:	
CLASS NO. : 93055	CONSIGNEE	:	
ANS RATING : CLASS 900	ENGINEERED BY :		
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : B	CONTR.JOB NO. :		
REV. DATE : 12/98	PROJECT NO. :		

ISSUE DATE		:	JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321	STAB HT
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP321	STAB HT

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F321	STAB HT
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F321/347	
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F321/347	
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP321	STAB HT
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP321	STAB HT
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F321	STAB HT

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP-S-321	STAB HT
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP-S-321	STAB HT
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP-S-321	STAB HT
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP-S-321	STAB HT

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321	STAB HT
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321	STAB HT
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F321	STAB HT
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP-S-321	STAB HT
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP-S-321	STAB HT
		DN 40-250	ASTM A403-WP-S/W-321	STAB HT
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A403-WP-S-321	STAB HT

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-300	BODY: ASTM A351-CF8C,A182-F321
			TRIM: AISI 321,STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-300	BODY: ASTM A351-CF8C,A182-F321
			TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A351-CF8C,A182-F321
			TRIM: AISI 321,STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-150	BODY: ASTM A351-CF8C,A182-F321
			TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED
			CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321 STAB HT
MTRR	METER RUN	DN 15- 40	AISI 321 STAB HT
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F321 STAB HT
STBT	STUD BOLT WITH NUTS	---	ASTM A453-GR.660 CLASS A

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE										
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE												
PIPE	74.36.19	018.1	026.1	034.1	050.1	058.1	066.1	076.1	085.1	096.1	112.1	124.1
PIPE NIPPLE 50MM	76.33.57	031.1	041.1	051.1	071.1							
* FLANGES												
BLIND FLANGE	76.65.08	262.1	264.1	266.1	268.1	270.1	222.1	224.1	226.1	228.1	230.1	232.1
SPECTACLE BLIND FLANGE	76.88.10	802.1	804.1	806.1	808.1	810.1	812.1	814.1	816.1	818.1	820.1	822.1
SPACER RING TYPE (ASME FLANGE)	76.88.15	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1
WELDING NECK FLANGE	76.65.77	122.1	124.1	126.1	128.1	130.1	012.1	054.1	056.1	202.1	204.1	206.1
* FITTINGS												
CAP BUTT-WELD.END	76.33.21	036.1	046.1	056.1	076.1	086.1	106.1	128.1	147.1	163.1	177.1	193.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	536.1	546.1	556.1	576.1	586.1	606.1	628.1	647.1	663.1	677.1	693.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.39	786.1	796.1	806.1	826.1	836.1	856.1	878.1	897.1	913.1	927.1	943.1
EQUAL TEE BUTT-WELD ENDS	76.33.83	786.1	796.1	806.1	826.1	836.1	856.1	878.1	897.1	913.1	927.1	943.1
* VALVES												
CHECK VALVE BUTT-WELD ENDS	77.14.24	153.1	154.1	155.1	157.1	158.1						
	77.14.87						160.1	162.1	164.1	185.1	186.1	187.1
GATE VALVE BUTT-WELD ENDS	77.24.24	153.1	154.1	155.1	157.1	158.1						
	77.24.87						160.1	162.1	164.1	185.1	186.1	187.1
GATE VALVE FLANGED	77.23.87	203.1	204.1	205.1	207.1	208.1						
GLOBE VALVE BUTT-WELD ENDS	77.34.24	153.1	154.1	155.1	157.1	158.1						
	77.34.87						160.1	162.1	164.1			
* MISCELLANEOUS												
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	468.1	470.1	474.1	476.1	478.1	480.1
METER RUN	76.65.97	132.1	134.1	136.1	138.1							
ORIFICE FLANGE SET	76.65.95					730.1	658.1	694.1	696.1	760.1	762.1	764.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.68.566.1	33.74.066.1	33.88.018.1
25* 15		33.68.576.1	33.74.076.1	33.88.028.1
25* 20		33.68.586.1	33.74.086.1	33.88.038.1
40* 15		33.68.596.1	33.74.096.1	33.88.042.1
40* 20		33.68.616.1	33.74.116.1	33.88.048.1
40* 25		33.68.626.1	33.74.126.1	33.88.058.1
50* 20		36.49.103.1	36.64.103.1	
50* 25		33.68.636.1	33.74.136.1	
50* 40		33.68.646.1	33.74.146.1	33.88.084.1
80* 40		33.68.676.1	33.74.176.1	33.88.094.1
80* 50	79.57.634.1	33.68.686.1	33.74.186.1	33.88.104.1
100* 40		36.49.193.1	36.64.193.1	
100* 50	79.58.182.1	33.68.707.1	33.74.207.1	33.88.201.1
100* 80	79.58.204.1	33.68.717.1	33.74.217.1	33.88.229.1
150* 50	79.58.184.1			
150* 80	79.58.206.1	33.68.746.1	33.74.246.1	33.88.257.1
150*100	79.58.410.1	33.68.758.1	33.74.258.1	33.88.286.1
200* 50	79.58.260.1			
200* 80	79.58.270.1			
200*100	79.58.070.1	33.68.772.1	33.74.272.1	33.88.317.1
200*150	79.58.080.1	33.68.784.1	33.74.284.1	33.88.345.1
250* 50	79.58.261.1			
250* 80	79.58.271.1			
250*100	79.58.071.1	36.49.341.1	36.64.341.1	33.88.369.1
250*150	79.58.081.1	33.68.798.1	33.74.298.1	33.88.394.1
250*200	79.59.001.1	33.68.814.1	33.74.314.1	33.88.420.1
300* 50	79.58.262.1			
300* 80	79.58.272.1			
300*100	79.58.072.1			
300*150	79.58.082.1	33.68.822.1	33.74.322.1	33.88.444.1
300*200	79.59.002.1	33.68.835.1	33.74.335.1	33.88.469.1
300*250	79.59.008.1	33.68.847.1	33.74.347.1	33.88.486.1

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-150	701.1	386.1
	200-300	702.1	387.1
20	40- 80	703.1	388.1
	100-300	704.1	389.1
25	40- 40	705.1	390.1
	50- 50	706.1	391.1
	80-100	707.1	392.1
	150-300	708.1	393.1
40	50- 50	710.1	394.1
	80- 80	711.1	395.1
	100-100	712.1	396.1
	150-300	713.1	397.1

LEVEL	DISPLACER	CHAMBER
LENGTH	MESCNUMBER	
356	76.80.61.602.1	
813	76.80.61.604.1	
1219	76.80.61.606.1	
1524	76.80.61.608.1	
1829	76.80.61.610.1	
2134	76.80.61.612.1	
2438	76.80.61.614.1	
2743	76.80.61.616.1	
3048	76.80.61.618.1	

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	3/4	* 110	15	4	3/4	* 110
20	4	3/4	* 110	20	4	3/4	* 120
25	4	7/8	* 130	25	4	7/8	* 130
40	4	1	* 140	40	4	1	* 140
50	8	7/8	* 150				
80	8	7/8	* 150				
100	8	1 1/8	* 170				
150	12	1 1/8	* 190				
200	12	1 3/8	* 220				
250	16	1 3/8	* 240				
300	20	1 3/8	* 250				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	3/4	* 120
				20	4	3/4	* 130
				25	4	7/8	* 140
				40	4	1	* 160
50	8	7/8	* 160	50	8	7/8	* 160
80	8	7/8	* 160	80	8	7/8	* 170
100	8	1 1/8	* 180	100	8	1 1/8	* 200
150	12	1 1/8	* 210	150	12	1 1/8	* 230
200	12	1 3/8	* 240	200	12	1 3/8	* 270
250	16	1 3/8	* 250	250	16	1 3/8	* 290
300	20	1 3/8	* 280	300	20	1 3/8	* 310

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.08.262.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.24.153.1	
PIPE NIPPLE 50MM	1	76.33.57.031.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.77.122.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.08.264.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.24.154.1	
PIPE NIPPLE 50MM	1	76.33.57.041.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.77.124.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.08.264.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.24.154.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.77.124.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	2	77.24.24.153.1	
LAP-JOINT FLANGE	2	76.65.20.608.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	2	76.65.77.122.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.24.153.1	
LAP-JOINT FLANGE	1	76.65.20.608.1	
PIPE NIPPLE 50MM	1	76.33.57.031.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.77.122.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.1M	DN 40 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.24.153.1	
LAP-JOINT FLANGE	1	76.65.20.608.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.77.122.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.87.203.1	
LAP-JOINT FLANGE	2	76.65.20.608.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
	8	81.38.74.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.687.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.74.472.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.687.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.74.472.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.08.262.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.24.153.1	
PIPE NIPPLE 50MM	1	76.33.57.031.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.77.122.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.08.264.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.24.154.1	
PIPE NIPPLE 50MM	1	76.33.57.041.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.77.124.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.08.264.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.24.154.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.77.124.1	

PIPING CLASSES ASME RATING 1500

CLASS 151011

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS								
		0	50	100	150	200	250	300	350	400

		PRESSURE BAR GA								
DN15	-400	250.6	250.4	231.9	226.0	219.2	208.6	193.5	184.7	161.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE												
	15	20	25	40	50	80	100	150	200	250	300	350	400
400	C	C	C	C	E	E	E	E	E	E	E	E	A
350	C	C	C	C	E	E	E	E	E	E	E	E	A
300	C	C	C	C	E	E	E	E	E	E	E	A	
250	C	C	C	C	E	E	E	E	E	E	A		
200	C	C	C	C	E	E	E	E	E	A			
150	C	C	C	C	E	E	E	E	A				
100	C	C	C	C	E	E	E	A					
80	C	C	C	C	E	E	A						
50	C	C	C	C	B	A							
40	C	B	B	A									
25	B	B	A										
20	B	A											
15	A												

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160
350	160
400	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 151011	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 151011, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE PIPE DN 15-400 ASTM A106-B

* FLANGES

BLFL BLIND FLANGE DN 15-400 ASTM A105
COFL COVER FLANGE THERMOWELL NOZZLE --- ASTM A105
LJFL LAP-JOINT FLANGE --- ASTM A105
SBFL SPECTACLE BLIND FLANGE DN 15-400 ASTM A516-60
SPRT SPACER RING TYPE (ASME FLANGE) DN 15-400 ASTM A516-60
WNFL WELDING NECK FLANGE DN 15-400 ASTM A105

* FITTINGS

CAPB CAP BUTT-WELD.END DN 15-400 ASTM A234-WPB
E45B ELBOW 45 DEG BUTT-WELD ENDS DN 15-400 ASTM A234-WPB
E90B ELBOW 90 DEG BUTT-WELD ENDS DN 15-400 ASTM A234-WPB
TEEB EQUAL TEE BUTT-WELD ENDS DN 15-400 ASTM A234-WPB

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET DN 15- 50 ASTM A105
BNIP BRANCH FITTING PLAIN-END OUTL. DN 15- 50 ASTM A105
BROB BRANCH OUTLET RED. BUTT WELD DN 80-400 ASTM A105
RECB REDUCER CONC BUTT WELD ENDS DN 20-400 ASTM A234-WPB
REEB REDUCER ECC BUTT WELD ENDS DN 20-400 ASTM A234-WPB
TERB TEE REDUCING BUTT WELD ENDS DN 20-400 ASTM A234-WPB

* VALVES

CHVF CHECK VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316(L),STELLITE 6
DN 50-400 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

GAVF GATE VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316(L),STELLITE 6
DN 50-400 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

GLVF GLOBE VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316(L),STELLITE 6
DN 50-100 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND

DN 15-400 AISI 316(L),GRAPHITE FILLED
CS CENTRING-/SS INNER RING

LDPC LEVEL DISPLACER CHAMBER

DN100-100 ASTM A106-B

MTRR METER RUN

DN 15- 40 AISI 316
LJ END FLANGES: ASTM A105

ORFS ORIFICE FLANGE SET

DN 50-400 ASTM A105

STBT STUD BOLT WITH NUTS

--- ASTM A193-B7/A194-2H

TWTG THERMOWELL TAPERED

DN 40- 40 AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 151011, REV.A PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE	74.30.05	020.1	030.1	040.1	060.1	073.1	113.1	161.1	227.1	267.1	309.1	349.1	399.1	453.1	
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	
SPECTACLE BLIND FLANGE	76.88.03	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	
WELDING NECK FLANGE	76.62.79	962.1	964.1	966.1	968.1	970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1	
* FITTINGS															
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	062.1	082.1	102.1	122.1	145.1	165.1	187.1	207.1	227.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1	
* VALVES															
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1										
	77.10.20					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1										
	77.20.20					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1										
	77.30.20					208.1	210.1	212.1							
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1	532.1	534.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.03.194.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.03.218.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.03.240.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.03.260.1	29.46.744.1	29.61.744.1	30.89.466.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.03.278.1	30.72.459.1	30.73.459.1	30.89.484.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.03.294.1	30.72.468.1	30.73.468.1	30.89.510.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.03.308.1	30.72.480.1	30.73.480.1	30.89.536.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.03.320.1	30.72.491.1	30.73.491.1	30.89.561.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1					
80* 40		30.72.231.1	30.73.231.1						
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1					
100* 40		30.72.259.1	30.73.259.1						
100* 50	79.03.182.1	30.72.271.1	30.73.271.1	30.89.155.1					
100* 80	79.03.206.1	30.72.281.1	30.73.281.1	30.89.167.1					
150* 50	79.03.184.1								
150* 80	79.03.208.1	30.72.301.1	30.73.301.1	30.89.179.1					
150*100	79.03.230.1	30.72.311.1	30.73.311.1	30.89.192.1					
200* 50	79.03.186.1								
200* 80	79.03.210.1								
200*100	79.03.232.1	30.72.331.1	30.73.331.1	30.89.208.1					
200*150	79.03.252.1	30.72.341.1	30.73.341.1	30.89.228.1					
250* 50	79.03.188.1								
250* 80	79.03.212.1								
250*100	79.03.234.1	30.72.349.1	30.73.349.1	30.89.256.1					
250*150	79.03.254.1	30.72.360.1	30.73.360.1	30.89.274.1					
250*200	79.03.272.1	30.72.370.1	30.73.370.1	30.89.296.1					
300* 50	79.03.190.1								
300* 80	79.03.214.1								
300*100	79.03.236.1								
300*150	79.03.256.1	30.72.389.1	30.73.389.1	30.89.313.1					
300*200	79.03.274.1	30.72.400.1	30.73.400.1	30.89.333.1					
300*250	79.03.290.1	30.72.410.1	30.73.410.1	30.89.355.1					
350* 50	79.03.192.1								
350* 80	79.03.216.1								
350*100	79.03.238.1								
350*150	79.03.258.1	30.72.419.1	30.73.419.1	30.89.376.1					
350*200	79.03.276.1	30.72.428.1	30.73.428.1	30.89.395.1					
350*250	79.03.292.1	30.72.441.1	30.73.441.1	30.89.420.1					
350*300	79.03.306.1	30.72.451.1	30.73.451.1	30.89.446.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	321.1	016.1
20	40-400	323.1	018.1
25	40-100	325.1	020.1
	150-400	326.1	024.1
40	50-100	330.1	026.1
	150-400	331.1	028.1
50	80-100	336.1	
	150-250	337.1	
	300-400	338.1	

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.122.1			230 76.83.37.001.1
813	76.80.60.124.1			255 76.83.37.002.1
1219	76.80.60.126.1			305 76.83.37.003.1
1524	76.80.60.128.1			355 76.83.37.005.1
1829	76.80.60.130.1			405 76.83.37.006.1
2134	76.80.60.132.1			455 76.83.37.007.1
2438	76.80.60.134.1			
2743	76.80.60.136.1			
3048	76.80.60.138.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 120	61.332.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	1 1/8	* 180	61.533.1					
100	8	1 1/4	* 200	61.588.1					
150	12	1 3/8	* 260	61.649.1					
200	12	1 5/8	* 350	61.734.1					
250	12	1 7/8	* 400	61.798.1					
300	16	2	* 440	61.829.1					
350	16	2 1/4	* 480	61.861.1					
400	16	2 1/2	* 530	83.704.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 170	61.409.1
80	8	1 1/8	* 190	61.535.1	80	8	1 1/8	* 210	61.538.1
100	8	1 1/4	* 210	61.595.1	100	8	1 1/4	* 230	61.598.1
150	12	1 3/8	* 280	61.652.1	150	12	1 3/8	* 300	61.655.1
200	12	1 5/8	* 360	61.736.1	200	12	1 5/8	* 400	61.741.1
250	12	1 7/8	* 420	61.802.1	250	12	1 7/8	* 460	61.806.1
300	16	2	* 460	61.834.1	300	16	2	* 510	83.562.1
350	16	2 1/4	* 500	83.631.1	350	16	2 1/4	* 560	83.637.1
400	16	2 1/2	* 550	83.706.1	400	16	2 1/2	* 620	83.713.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	4	81.38.61.330.1	
	1	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
	4	81.38.61.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL TAPERED	L=230 MM	1	76.83.37.001.1

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL TAPERED	L=255 MM	1	76.83.37.002.1

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	

CLASS 151015

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	150	200	250	300	350	400

	PRESSURE BAR GA						
DN15 -400	222.3	222.3	218.8	208.6	193.5	184.7	161.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
350	C	C	C	C	E	E	E	E	E	E	E	E	A		
300	C	C	C	C	E	E	E	E	E	E	E	A			
250	C	C	C	C	E	E	E	E	E	E	A				
200	C	C	C	C	E	E	E	E	A						
150	C	C	C	C	E	E	E	A							
100	C	C	C	C	E	E	A								
80	C	C	C	C	E	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160
350	160
400	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 151015		CONSIGNEE	:	
ANS RATING : CLASS 1500		ENGINEERED BY :		
CORR. ALL. : 1 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO. :		
REV. DATE : 12/96		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 151015, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWTG	THERMOWELL TAPERED	DN 40- 40	AISI 316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 151015, REV.A PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION		MESC													

* PIPE															
PIPE		74.30.03	020.1	030.1	040.1	060.1	073.1	113.1	161.1	227.1	267.1	309.1	349.1	399.1	453.1
PIPE NIPPLE 50MM		76.30.54	036.1	046.1	056.1	076.1									
* FLANGES															
BLIND FLANGE		76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1
SPECTACLE BLIND FLANGE		76.88.37	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
SPACER RING TYPE (ASME FLANGE)		76.88.46	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
WELDING NECK FLANGE		76.62.79	962.1	964.1	966.1	968.1	970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1
* FITTINGS															
CAP BUTT-WELD.END		76.30.17	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1
* VALVES															
CHECK VALVE BUTT-WELD ENDS		77.11.14	223.1	224.1	225.1	227.1									
CHECK VALVE FLANGED		77.10.05	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
GATE VALVE BUTT-WELD ENDS		77.21.14	403.1	404.1	405.1	407.1									
GATE VALVE FLANGED		77.20.04	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
GLOBE VALVE BUTT-WELD ENDS		77.31.14	403.1	404.1	405.1	407.1									
GLOBE VALVE FLANGED		77.30.05	203.1	204.1	205.1	207.1	208.1	210.1	212.1						
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1	532.1	534.1
METER RUN		76.65.96	282.1	284.1	286.1	288.1									
ORIFICE FLANGE SET		76.62.95					970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.66.141.1	30.67.141.1	30.88.039.1	400* 50	79.03.194.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.03.218.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.03.240.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.03.260.1	29.47.744.1	29.47.744.1	30.88.466.1
40* 20		30.66.181.1	30.67.181.1		400*200	79.03.278.1	30.66.459.1	30.67.459.1	30.88.484.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250	79.03.294.1	30.66.468.1	30.67.468.1	30.88.510.1
50* 20		30.66.195.1	30.67.195.1		400*300	79.03.308.1	30.66.480.1	30.67.480.1	30.88.536.1
50* 25		30.66.201.1	30.67.201.1		400*350	79.03.320.1	30.66.491.1	30.67.491.1	30.88.561.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1					
80* 40		30.66.231.1	30.67.231.1						
80* 50	79.03.180.1	30.66.241.1	30.67.241.1	30.88.134.1					
100* 40		30.66.259.1	30.67.259.1						
100* 50	79.03.182.1	30.66.271.1	30.67.271.1	30.88.155.1					
100* 80	79.03.206.1	30.66.281.1	30.67.281.1	30.88.167.1					
150* 50	79.03.184.1								
150* 80	79.03.208.1	30.66.301.1	30.67.301.1	30.88.179.1					
150*100	79.03.230.1	30.66.311.1	30.67.311.1	30.88.192.1					
200* 50	79.03.186.1								
200* 80	79.03.210.1								
200*100	79.03.232.1	30.66.331.1	30.67.331.1	30.88.208.1					
200*150	79.03.252.1	30.66.341.1	30.67.341.1	30.88.228.1					
250* 50	79.03.188.1								
250* 80	79.03.212.1								
250*100	79.03.234.1	30.66.349.1	30.67.349.1	30.88.256.1					
250*150	79.03.254.1	30.66.360.1	30.67.360.1	30.88.274.1					
250*200	79.03.272.1	30.66.370.1	30.67.370.1	30.88.296.1					
300* 50	79.03.190.1								
300* 80	79.03.214.1								
300*100	79.03.236.1								
300*150	79.03.256.1	30.66.389.1	30.67.389.1	30.88.313.1					
300*200	79.03.274.1	30.66.400.1	30.67.400.1	30.88.333.1					
300*250	79.03.290.1	30.66.410.1	30.67.410.1	30.88.355.1					
350* 50	79.03.192.1								
350* 80	79.03.216.1								
350*100	79.03.238.1								
350*150	79.03.258.1	30.66.419.1	30.67.419.1	30.88.376.1					
350*200	79.03.276.1	30.66.428.1	30.67.428.1	30.88.395.1					
350*250	79.03.292.1	30.66.441.1	30.67.441.1	30.88.420.1					
350*300	79.03.306.1	30.66.451.1	30.67.451.1	30.88.446.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	321.1	016.1
20	40-400	323.1	018.1
25	40-100	325.1	020.1
	150-400	326.1	024.1
40	50-100	330.1	026.1
	150-400	331.1	028.1
50	80-100	336.1	
	150-250	337.1	
	300-400	338.1	

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.482.1			230 76.83.37.001.1
813	76.80.60.484.1			255 76.83.37.002.1
1219	76.80.60.486.1			305 76.83.37.003.1
1524	76.80.60.488.1			355 76.83.37.005.1
1829	76.80.60.490.1			405 76.83.37.006.1
2134	76.80.60.492.1			455 76.83.37.007.1
2438	76.80.60.494.1			
2743	76.80.60.496.1			
3048	76.80.60.498.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	66.330.1	15	4	3/4	* 110	66.330.1
20	4	3/4	* 120	66.332.1	20	4	3/4	* 120	66.332.1
25	4	7/8	* 130	66.403.1	25	4	7/8	* 130	66.403.1
40	4	1	* 140	66.469.1	40	4	1	* 140	66.469.1
50	8	7/8	* 150	66.406.1					
80	8	1 1/8	* 180	66.533.1					
100	8	1 1/4	* 200	66.588.1					
150	12	1 3/8	* 260	66.649.1					
200	12	1 5/8	* 350	66.734.1					
250	12	1 7/8	* 400	66.798.1					
300	16	2	* 440	66.829.1					
350	16	2 1/4	* 480	66.861.1					
400	16	2 1/2	* 530	86.704.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	66.332.1
					20	4	3/4	* 130	66.334.1
					25	4	7/8	* 140	66.404.1
					40	4	1	* 160	66.472.1
50	8	7/8	* 160	66.407.1	50	8	7/8	* 170	66.409.1
80	8	1 1/8	* 190	66.535.1	80	8	1 1/8	* 210	66.538.1
100	8	1 1/4	* 210	66.595.1	100	8	1 1/4	* 230	66.598.1
150	12	1 3/8	* 280	66.652.1	150	12	1 3/8	* 300	66.655.1
200	12	1 5/8	* 360	66.736.1	200	12	1 5/8	* 400	66.741.1
250	12	1 7/8	* 420	66.802.1	250	12	1 7/8	* 460	66.806.1
300	16	2	* 460	66.834.1	300	16	2	* 510	86.562.1
350	16	2 1/4	* 500	86.631.1	350	16	2 1/4	* 560	86.637.1
400	16	2 1/2	* 550	86.706.1	400	16	2 1/2	* 620	86.713.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.66.332.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.66.332.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	2	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
WELDING NECK FLANGE	4	81.38.66.330.1	
	1	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
	4	81.38.66.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
	8	81.38.66.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.66.472.1	
THERMOWELL TAPERED	L=230 MM	1	76.83.37.001.1

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.66.472.1	
THERMOWELL TAPERED	L=255 MM	1	76.83.37.002.1

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.66.332.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.66.332.1	

CLASS 151031

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS									
	0	100	150	200	250	300	350	400	

PRESSURE BAR GA									
DN15 -400	230.0	230.0	226.0	219.1	208.6	193.5	184.7	148.5	

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE													
	15	20	25	40	50	80	100	150	200	250	300	350	400	
400	J	J	J	J	E	E	E	E	E	E	E	E	A	
350	J	J	J	J	E	E	E	E	E	E	E	E	A	
300	J	J	J	J	E	E	E	E	E	E	E	A		
250	J	J	J	J	E	E	E	E	E	E	A			
200	J	J	J	J	E	E	E	E	E	A				
150	J	J	J	J	E	E	E	A						
100	J	J	J	J	E	E	A							
80	J	J	J	J	E	A								
50	J	J	J	B	A									
40	J	B	B	A										
25	B	B	A											
20	B	A												
15	A													

TABLE OF SCHEDULES

DN	SCHEDULE
15	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	160
250	160
300	160
350	160
400	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
E	BRANCH OUTLET
J	BRANCH FITTING

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 151031	CONSIGNEE	:	
ANS RATING : CLASS 1500	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE PIPE DN 15-400 ASTM A106-B

* FLANGES

BLFL BLIND FLANGE DN 15-400 ASTM A105
COFL COVER FLANGE THERMOWELL NOZZLE --- ASTM A105
LJFL LAP-JOINT FLANGE --- ASTM A105
SBFL SPECTACLE BLIND FLANGE DN 15-400 ASTM A516-60
SPRT SPACER RING TYPE (ASME FLANGE) DN 15-400 ASTM A516-60
WNFL WELDING NECK FLANGE DN 15-400 ASTM A105

* FITTINGS

CAPB CAP BUTT-WELD.END DN 15-400 ASTM A234-WPB
E45B ELBOW 45 DEG BUTT-WELD ENDS DN 15-400 ASTM A234-WPB
E90B ELBOW 90 DEG BUTT-WELD ENDS DN 15-400 ASTM A234-WPB
TEEB EQUAL TEE BUTT-WELD ENDS DN 15-400 ASTM A234-WPB

* REDUCING FITTINGS

BNIB BRANCH FITTING B.W.END OUTLET DN 15- 50 ASTM A105
BNIF BRANCH FITTING FLANGED OUTLET DN 15- 50 ASTM A105
BROB BRANCH OUTLET RED. BUTT WELD DN 80-400 ASTM A105
RECB REDUCER CONC BUTT WELD ENDS DN 20-400 ASTM A234-WPB
REEB REDUCER ECC BUTT WELD ENDS DN 20-400 ASTM A234-WPB
TERB TEE REDUCING BUTT WELD ENDS DN 20-400 ASTM A234-WPB

* VALVES

CHVF CHECK VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316 (L),STELLITE 6
DN 50-400 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

GAVF GATE VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316 (L),STELLITE 6
DN 50-400 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

GLVF GLOBE VALVE FLANGED

DN 15- 40 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316 (L),STELLITE 6
DN 50-100 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 410

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND

DN 15-400 AISI 316 (L),GRAPHITE FILLED
CS CENTRING-/SS INNER RING

LDPC LEVEL DISPLACER CHAMBER

DN100-100 ASTM A106-B

MTRR METER RUN

DN 15- 40 AISI 316
LJ END FLANGES: ASTM A105

ORFS ORIFICE FLANGE SET

DN 50-400 ASTM A105

STBT STUD BOLT WITH NUTS

--- ASTM A193-B7/A194-2H

TWTG THERMOWELL TAPERED

DN 50- 50 ASTM A182-F316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 151031, REV.A PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE	74.30.05	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1	267.1	309.1	349.1	399.1	453.1	
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	
SPECTACLE BLIND FLANGE	76.88.03	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	
WELDING NECK FLANGE	76.62.79									978.1	980.1	982.1	984.1	986.1	
	76.62.80	032.1	034.1	036.1	038.1	040.1	044.1	046.1	048.1						
* FITTINGS															
CAP BUTT-WELD.END	76.30.19	023.1	029.1	033.1	043.1	063.1	083.1	103.1	123.1	145.1	165.1	187.1	207.1	227.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1	
* VALVES															
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1										
	77.10.20					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1										
	77.20.20					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1										
	77.30.20					208.1	210.1	212.1							
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1	532.1	534.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					140.1	144.1	146.1	148.1	978.1	980.1	982.1	984.1	986.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.142.1	30.73.142.1	30.89.040.1	400* 50	79.03.107.1			
25* 15		30.72.152.1	30.73.152.1	30.89.050.1	400* 80	79.03.120.1			
25* 20		30.72.162.1	30.73.162.1	30.89.060.1	400*100	79.03.131.1			
40* 15		30.72.172.1	30.73.172.1	30.89.070.1	400*150	79.03.142.1	29.46.760.1	29.61.760.1	
40* 20		30.72.182.1	30.73.182.1	30.89.080.1	400*200	79.03.278.1	30.72.459.1	30.73.459.1	30.89.484.1
40* 25		30.72.192.1	30.73.192.1	30.89.090.1	400*250	79.03.294.1	30.72.468.1	30.73.468.1	30.89.510.1
50* 20		29.46.196.1	29.61.196.1		400*300	79.03.308.1	30.72.480.1	30.73.480.1	30.89.536.1
50* 25		30.72.202.1	30.73.202.1		400*350	79.03.320.1	30.72.491.1	30.73.491.1	30.89.561.1
50* 40		30.72.212.1	30.73.212.1	30.89.117.1					
80* 40		30.72.232.1	30.73.232.1						
80* 50	79.03.680.1	30.72.242.1	30.73.242.1	30.89.135.1					
100* 40		30.72.260.1	30.73.260.1						
100* 50	79.03.682.1	30.72.272.1	30.73.272.1	30.89.156.1					
100* 80	79.03.694.1	30.72.282.1	30.73.282.1	30.89.168.1					
150* 50	79.03.684.1								
150* 80	79.03.696.1	30.72.302.1	30.73.302.1	30.89.180.1					
150*100	79.03.704.1	30.72.312.1	30.73.312.1	30.89.193.1					
200* 50	79.03.103.1								
200* 80	79.03.116.1								
200*100	79.03.127.1	30.72.332.1	30.73.332.1						
200*150	79.03.138.1	30.72.342.1	30.73.342.1						
250* 50	79.03.104.1								
250* 80	79.03.117.1								
250*100	79.03.128.1	29.46.354.1	29.61.354.1						
250*150	79.03.139.1	30.72.357.1	30.73.357.1						
250*200	79.03.272.1	30.72.370.1	30.73.370.1	30.89.296.1					
300* 50	79.03.105.1								
300* 80	79.03.118.1								
300*100	79.03.129.1								
300*150	79.03.140.1	30.72.391.1	30.73.391.1						
300*200	79.03.274.1	30.72.400.1	30.73.400.1	30.89.333.1					
300*250	79.03.290.1	30.72.410.1	30.73.410.1	30.89.355.1					
350* 50	79.03.106.1								
350* 80	79.03.119.1								
350*100	79.03.130.1								
350*150	79.03.141.1	29.46.612.1	29.61.612.1						
350*200	79.03.276.1	30.72.428.1	30.73.428.1	30.89.395.1					
350*250	79.03.292.1	30.72.441.1	30.73.441.1	30.89.420.1					
350*300	79.03.306.1	30.72.451.1	30.73.451.1	30.89.446.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-400	072.1	341.1
20	40-400	078.1	343.1
25	40-100	080.1	345.1
	150-400	084.1	346.1
40	50-100	086.1	350.1
	150-400	088.1	351.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.122.1			230 76.83.38.001.1
813	76.80.60.124.1			255 76.83.38.002.1
1219	76.80.60.126.1			305 76.83.38.003.1
1524	76.80.60.128.1			355 76.83.38.005.1
1829	76.80.60.130.1			405 76.83.38.006.1
2134	76.80.60.132.1			455 76.83.38.007.1
2438	76.80.60.134.1			
2743	76.80.60.136.1			
3048	76.80.60.138.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIB	BRANCH FITTING B.W.END OUTLET
BNIF	BRANCH FITTING FLANGED OUTLET
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	3/4	* 110	15	4	3/4	* 110
20	4	3/4	* 120	20	4	3/4	* 120
25	4	7/8	* 130	25	4	7/8	* 130
40	4	1	* 140	40	4	1	* 140
50	8	7/8	* 150				
80	8	1 1/8	* 180				
100	8	1 1/4	* 200				
150	12	1 3/8	* 260				
200	12	1 5/8	* 350				
250	12	1 7/8	* 400				
300	16	2	* 440				
350	16	2 1/4	* 480				
400	16	2 1/2	* 530				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	3/4	* 120
				20	4	3/4	* 130
				25	4	7/8	* 140
				40	4	1	* 160
50	8	7/8	* 160	50	8	7/8	* 170
80	8	1 1/8	* 190	80	8	1 1/8	* 210
100	8	1 1/4	* 210	100	8	1 1/4	* 230
150	12	1 3/8	* 280	150	12	1 3/8	* 300
200	12	1 5/8	* 360	200	12	1 5/8	* 400
250	12	1 7/8	* 420	250	12	1 7/8	* 460
300	16	2	* 460	300	16	2	* 510
350	16	2 1/4	* 500	350	16	2 1/4	* 560
400	16	2 1/2	* 550	400	16	2 1/2	* 620

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.408.1
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GATE VALVE FLANGED 1 77.20.04.203.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.80.032.1

* DRAIN POINT DN 20 FIG.0I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 2 85.41.46.506.1
GATE VALVE FLANGED 1 77.20.04.204.1
STUD BOLT WITH NUTS 8 81.38.61.332.1
WELDING NECK FLANGE 1 76.62.80.034.1

* DRAIN POINT DN 20 FIG.0H DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 2 85.41.46.506.1
GATE VALVE FLANGED 1 77.20.04.204.1
STUD BOLT WITH NUTS 8 81.38.61.332.1

* ORIFICE INSTR.CONN. DN 15 FIG.0I DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.504.1
GATE VALVE FLANGED 2 77.20.04.203.1
LAP-JOINT FLANGE 2 76.62.20.508.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
WELDING NECK FLANGE 2 76.62.80.032.1

* PRESSURE INSTR.CONN. DN 15 FIG.0I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GATE VALVE FLANGED 1 77.20.04.203.1
LAP-JOINT FLANGE 1 76.62.20.508.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 4 81.38.61.330.1
1 76.62.80.032.1

* PRESSURE INSTR.CONN. DN 15 FIG.0H DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GATE VALVE FLANGED 1 77.20.04.203.1
LAP-JOINT FLANGE 1 76.62.20.508.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
4 81.38.61.330.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.504.1
GATE VALVE FLANGED 2 77.20.04.203.1
LAP-JOINT FLANGE 2 76.62.20.508.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
8 81.38.61.330.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.537.1
GASKET, SPIRAL WOUND 1 85.41.46.512.1
STUD BOLT WITH NUTS 4 81.38.61.472.1

* TEMPERATURE INSTR.C. DN 50 FIG.BB DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.547.1
GASKET, SPIRAL WOUND 1 85.41.46.514.1
STUD BOLT WITH NUTS 8 81.38.61.474.1
THERMOWELL TAPERED L=255 MM 1 76.83.38.002.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.408.1
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GLOBE VALVE FLANGED 1 77.30.05.203.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.80.032.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 2 85.41.46.506.1
GLOBE VALVE FLANGED 1 77.30.05.204.1
STUD BOLT WITH NUTS 8 81.38.61.332.1
WELDING NECK FLANGE 1 76.62.80.034.1

* VENT POINT DN 20 FIG.1H DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 2 85.41.46.506.1
GLOBE VALVE FLANGED 1 77.30.05.204.1
STUD BOLT WITH NUTS 8 81.38.61.332.1

CLASS 151041

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	

	PRESSURE BAR GA									
DN15 -400	250.6	250.4	231.9	226.0	219.2	208.6	193.5	184.7	161.7	

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400		
400	C	C	C	C	E	E	E	E	E	E	E	E	E	A	
350	C	C	C	C	E	E	E	E	E	E	E	E	A		
300	C	C	C	C	E	E	E	E	E	E	E	A			
250	C	C	C	C	E	E	E	E	E	E	A				
200	C	C	C	C	E	E	E	E	A						
150	C	C	C	C	E	E	E	A							
100	C	C	C	C	E	E	A								
80	C	C	C	C	E	A									
50	C	C	C	B	A										
40	C	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160
350	160
400	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 151041	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : 0	CONTR.JOB NO. :	
REV. DATE : 12/96	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316 (L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE	74.30.05	020.1	030.1	040.1	060.1	073.1	113.1	161.1	227.1	267.1	309.1	349.1	399.1	453.1	
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	
SPECTACLE BLIND FLANGE	76.88.03	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	
SPACER RING TYPE (ASME FLANGE)	76.88.16	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	
WELDING NECK FLANGE	76.62.79	962.1	964.1	966.1	968.1	970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1	
* FITTINGS															
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	062.1	082.1	102.1	122.1	145.1	165.1	187.1	207.1	227.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1	
* VALVES															
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1	208.1	210.1	212.1							
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1	532.1	534.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.03.194.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.03.218.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.03.240.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.03.260.1	29.46.744.1	29.61.744.1	30.89.466.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.03.278.1	30.72.459.1	30.73.459.1	30.89.484.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.03.294.1	30.72.468.1	30.73.468.1	30.89.510.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.03.308.1	30.72.480.1	30.73.480.1	30.89.536.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.03.320.1	30.72.491.1	30.73.491.1	30.89.561.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1					
80* 40		30.72.231.1	30.73.231.1						
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1					
100* 40		30.72.259.1	30.73.259.1						
100* 50	79.03.182.1	30.72.271.1	30.73.271.1	30.89.155.1					
100* 80	79.03.206.1	30.72.281.1	30.73.281.1	30.89.167.1					
150* 50	79.03.184.1								
150* 80	79.03.208.1	30.72.301.1	30.73.301.1	30.89.179.1					
150*100	79.03.230.1	30.72.311.1	30.73.311.1	30.89.192.1					
200* 50	79.03.186.1								
200* 80	79.03.210.1								
200*100	79.03.232.1	30.72.331.1	30.73.331.1	30.89.208.1					
200*150	79.03.252.1	30.72.341.1	30.73.341.1	30.89.228.1					
250* 50	79.03.188.1								
250* 80	79.03.212.1								
250*100	79.03.234.1	30.72.349.1	30.73.349.1	30.89.256.1					
250*150	79.03.254.1	30.72.360.1	30.73.360.1	30.89.274.1					
250*200	79.03.272.1	30.72.370.1	30.73.370.1	30.89.296.1					
300* 50	79.03.190.1								
300* 80	79.03.214.1								
300*100	79.03.236.1								
300*150	79.03.256.1	30.72.389.1	30.73.389.1	30.89.313.1					
300*200	79.03.274.1	30.72.400.1	30.73.400.1	30.89.333.1					
300*250	79.03.290.1	30.72.410.1	30.73.410.1	30.89.355.1					
350* 50	79.03.192.1								
350* 80	79.03.216.1								
350*100	79.03.238.1								
350*150	79.03.258.1	30.72.419.1	30.73.419.1	30.89.376.1					
350*200	79.03.276.1	30.72.428.1	30.73.428.1	30.89.395.1					
350*250	79.03.292.1	30.72.441.1	30.73.441.1	30.89.420.1					
350*300	79.03.306.1	30.72.451.1	30.73.451.1	30.89.446.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	321.1	016.1
20	40-400	323.1	018.1
25	40-100	325.1	020.1
	150-400	326.1	024.1
40	50-100	330.1	026.1
	150-400	331.1	028.1
50	80-100	336.1	
	150-250	337.1	
	300-400	338.1	

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.122.1			230 76.83.37.001.1
813	76.80.60.124.1			255 76.83.37.002.1
1219	76.80.60.126.1			305 76.83.37.003.1
1524	76.80.60.128.1			355 76.83.37.005.1
1829	76.80.60.130.1			405 76.83.37.006.1
2134	76.80.60.132.1			455 76.83.37.007.1
2438	76.80.60.134.1			
2743	76.80.60.136.1			
3048	76.80.60.138.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 120	61.332.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	1 1/8	* 180	61.533.1					
100	8	1 1/4	* 200	61.588.1					
150	12	1 3/8	* 260	61.649.1					
200	12	1 5/8	* 350	61.734.1					
250	12	1 7/8	* 400	61.798.1					
300	16	2	* 440	61.829.1					
350	16	2 1/4	* 480	61.861.1					
400	16	2 1/2	* 530	83.704.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 170	61.409.1
80	8	1 1/8	* 190	61.535.1	80	8	1 1/8	* 210	61.538.1
100	8	1 1/4	* 210	61.595.1	100	8	1 1/4	* 230	61.598.1
150	12	1 3/8	* 280	61.652.1	150	12	1 3/8	* 300	61.655.1
200	12	1 5/8	* 360	61.736.1	200	12	1 5/8	* 400	61.741.1
250	12	1 7/8	* 420	61.802.1	250	12	1 7/8	* 460	61.806.1
300	16	2	* 460	61.834.1	300	16	2	* 510	83.562.1
350	16	2 1/4	* 500	83.631.1	350	16	2 1/4	* 560	83.637.1
400	16	2 1/2	* 550	83.706.1	400	16	2 1/2	* 620	83.713.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.20.04.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	4	81.38.61.330.1	
	1	76.62.79.962.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.20.04.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
	4	81.38.61.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL TAPERED	L=230 MM	1	76.83.37.001.1

* TEMPERATURE INSTR.C.	DN 40	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.537.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.61.472.1	
THERMOWELL TAPERED	L=255 MM	1	76.83.37.002.1

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.30.05.203.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.79.962.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	
WELDING NECK FLANGE	1	76.62.79.964.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.30.05.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	

CLASS 151042

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS									
	0	100	150	200	250	300	350	400	

PRESSURE BAR GA									
DN15 -400	230.0	230.0	226.0	219.1	208.6	193.5	184.7	148.5	

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE									
	15	20	25	40	50	80	100	150	200	250 300 350 400
400	J	J	J	J	E	E	E	E	E	E E A
350	J	J	J	J	E	E	E	E	E	E E A
300	J	J	J	J	E	E	E	E	E	E A
250	J	J	J	J	E	E	E	E	E	A
200	J	J	J	J	E	E	E	E	A	
150	J	J	J	J	E	E	E	A		
100	J	J	J	J	E	E	A			
80	J	J	J	J	E	A				
50	J	J	J	B	A					
40	J	B	B	A						
25	B	B	A							
20	B	A								
15	A									

TABLE OF SCHEDULES

DN	SCHEDULE
15	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	160
250	160
300	160
350	160
400	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
E	BRANCH OUTLET
J	BRANCH FITTING

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL	PLANT	:	
CLASS NO. : 151042	CONSIGNEE	:	
ANS RATING : CLASS 1500	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : 0	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIB	BRANCH FITTING B.W.END OUTLET	DN 15- 50	ASTM A105
BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 50- 50	ASTM A182-F316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE												
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE														
PIPE	74.30.05	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1	267.1	309.1	349.1	399.1	453.1
* FLANGES														
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1
SPECTACLE BLIND FLANGE	76.88.03	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
WELDING NECK FLANGE	76.62.79									978.1	980.1	982.1	984.1	986.1
	76.62.80	032.1	034.1	036.1	038.1	040.1	044.1	046.1	048.1					
* FITTINGS														
CAP BUTT-WELD.END	76.30.19	023.1	029.1	033.1	043.1	063.1	083.1	103.1	123.1	145.1	165.1	187.1	207.1	227.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1
* VALVES														
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1	208.1	210.1	212.1						
* MISCELLANEOUS														
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1	532.1	534.1
METER RUN	76.65.96	282.1	284.1	286.1	288.1									
ORIFICE FLANGE SET	76.62.95					140.1	144.1	146.1	148.1	978.1	980.1	982.1	984.1	986.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.142.1	30.73.142.1	30.89.040.1	400* 50	79.03.107.1			
25* 15		30.72.152.1	30.73.152.1	30.89.050.1	400* 80	79.03.120.1			
25* 20		30.72.162.1	30.73.162.1	30.89.060.1	400*100	79.03.131.1			
40* 15		30.72.172.1	30.73.172.1	30.89.070.1	400*150	79.03.142.1	29.46.760.1	29.61.760.1	
40* 20		30.72.182.1	30.73.182.1	30.89.080.1	400*200	79.03.278.1	30.72.459.1	30.73.459.1	30.89.484.1
40* 25		30.72.192.1	30.73.192.1	30.89.090.1	400*250	79.03.294.1	30.72.468.1	30.73.468.1	30.89.510.1
50* 20		29.46.196.1	29.61.196.1		400*300	79.03.308.1	30.72.480.1	30.73.480.1	30.89.536.1
50* 25		30.72.202.1	30.73.202.1		400*350	79.03.320.1	30.72.491.1	30.73.491.1	30.89.561.1
50* 40		30.72.212.1	30.73.212.1	30.89.117.1					
80* 40		30.72.232.1	30.73.232.1						
80* 50	79.03.680.1	30.72.242.1	30.73.242.1	30.89.135.1					
100* 40		30.72.260.1	30.73.260.1						
100* 50	79.03.682.1	30.72.272.1	30.73.272.1	30.89.156.1					
100* 80	79.03.694.1	30.72.282.1	30.73.282.1	30.89.168.1					
150* 50	79.03.684.1								
150* 80	79.03.696.1	30.72.302.1	30.73.302.1	30.89.180.1					
150*100	79.03.704.1	30.72.312.1	30.73.312.1	30.89.193.1					
200* 50	79.03.103.1								
200* 80	79.03.116.1								
200*100	79.03.127.1	30.72.332.1	30.73.332.1						
200*150	79.03.138.1	30.72.342.1	30.73.342.1						
250* 50	79.03.104.1								
250* 80	79.03.117.1								
250*100	79.03.128.1	29.46.354.1	29.61.354.1						
250*150	79.03.139.1	30.72.357.1	30.73.357.1						
250*200	79.03.272.1	30.72.370.1	30.73.370.1	30.89.296.1					
300* 50	79.03.105.1								
300* 80	79.03.118.1								
300*100	79.03.129.1								
300*150	79.03.140.1	30.72.391.1	30.73.391.1						
300*200	79.03.274.1	30.72.400.1	30.73.400.1	30.89.333.1					
300*250	79.03.290.1	30.72.410.1	30.73.410.1	30.89.355.1					
350* 50	79.03.106.1								
350* 80	79.03.119.1								
350*100	79.03.130.1								
350*150	79.03.141.1	29.46.612.1	29.61.612.1						
350*200	79.03.276.1	30.72.428.1	30.73.428.1	30.89.395.1					
350*250	79.03.292.1	30.72.441.1	30.73.441.1	30.89.420.1					
350*300	79.03.306.1	30.72.451.1	30.73.451.1	30.89.446.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-400	072.1	341.1
20	40-400	078.1	343.1
25	40-100	080.1	345.1
	150-400	084.1	346.1
40	50-100	086.1	350.1
	150-400	088.1	351.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.122.1			230 76.83.38.001.1
813	76.80.60.124.1			255 76.83.38.002.1
1219	76.80.60.126.1			305 76.83.38.003.1
1524	76.80.60.128.1			355 76.83.38.005.1
1829	76.80.60.130.1			405 76.83.38.006.1
2134	76.80.60.132.1			455 76.83.38.007.1
2438	76.80.60.134.1			
2743	76.80.60.136.1			
3048	76.80.60.138.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIB	BRANCH FITTING B.W.END OUTLET
BNIF	BRANCH FITTING FLANGED OUTLET
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

				81.38					81.38
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 120	61.332.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	1 1/8	* 180	61.533.1					
100	8	1 1/4	* 200	61.588.1					
150	12	1 3/8	* 260	61.649.1					
200	12	1 5/8	* 350	61.734.1					
250	12	1 7/8	* 400	61.798.1					
300	16	2	* 440	61.829.1					
350	16	2 1/4	* 480	61.861.1					
400	16	2 1/2	* 530	83.704.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

				81.38					81.38
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 170	61.409.1
80	8	1 1/8	* 190	61.535.1	80	8	1 1/8	* 210	61.538.1
100	8	1 1/4	* 210	61.595.1	100	8	1 1/4	* 230	61.598.1
150	12	1 3/8	* 280	61.652.1	150	12	1 3/8	* 300	61.655.1
200	12	1 5/8	* 360	61.736.1	200	12	1 5/8	* 400	61.741.1
250	12	1 7/8	* 420	61.802.1	250	12	1 7/8	* 460	61.806.1
300	16	2	* 460	61.834.1	300	16	2	* 510	83.562.1
350	16	2 1/4	* 500	83.631.1	350	16	2 1/4	* 560	83.637.1
400	16	2 1/2	* 550	83.706.1	400	16	2 1/2	* 620	83.713.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.OI DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.408.1
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GATE VALVE FLANGED 1 77.20.04.203.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.80.032.1

* DRAIN POINT DN 20 FIG.OI DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 2 85.41.46.506.1
GATE VALVE FLANGED 1 77.20.04.204.1
STUD BOLT WITH NUTS 8 81.38.61.332.1
WELDING NECK FLANGE 1 76.62.80.034.1

* DRAIN POINT DN 20 FIG.OH DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 2 85.41.46.506.1
GATE VALVE FLANGED 1 77.20.04.204.1
STUD BOLT WITH NUTS 8 81.38.61.332.1

* ORIFICE INSTR.CONN. DN 15 FIG.OI DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.504.1
GATE VALVE FLANGED 2 77.20.04.203.1
LAP-JOINT FLANGE 2 76.62.20.508.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
WELDING NECK FLANGE 2 76.62.80.032.1

* PRESSURE INSTR.CONN. DN 15 FIG.OI DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GATE VALVE FLANGED 1 77.20.04.203.1
LAP-JOINT FLANGE 1 76.62.20.508.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 4 81.38.61.330.1
1 76.62.80.032.1

* PRESSURE INSTR.CONN. DN 15 FIG.OH DN 40 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GATE VALVE FLANGED 1 77.20.04.203.1
LAP-JOINT FLANGE 1 76.62.20.508.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
4 81.38.61.330.1

* METERRUN INSTR. CONN DN 15 FIG.OH DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.504.1
GATE VALVE FLANGED 2 77.20.04.203.1
LAP-JOINT FLANGE 2 76.62.20.508.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
8 81.38.61.330.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.537.1
GASKET, SPIRAL WOUND 1 85.41.46.512.1
STUD BOLT WITH NUTS 4 81.38.61.472.1

* TEMPERATURE INSTR.C. DN 50 FIG.BB DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.547.1
GASKET, SPIRAL WOUND 1 85.41.46.514.1
STUD BOLT WITH NUTS 8 81.38.61.474.1
THERMOWELL TAPERED L=255 MM 1 76.83.38.002.1

* VENT POINT DN 15 FIG.1I DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.408.1
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GLOBE VALVE FLANGED 1 77.30.05.203.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.80.032.1

* VENT POINT DN 20 FIG.1I DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 2 85.41.46.506.1
GLOBE VALVE FLANGED 1 77.30.05.204.1
STUD BOLT WITH NUTS 8 81.38.61.332.1
WELDING NECK FLANGE 1 76.62.80.034.1

* VENT POINT DN 20 FIG.1H DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 2 85.41.46.506.1
GLOBE VALVE FLANGED 1 77.30.05.204.1
STUD BOLT WITH NUTS 8 81.38.61.332.1

CLASS 151055

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	50	150	200	250	300	350	400

	PRESSURE BAR GA							
DN15 -400	222.3	222.3	222.3	218.8	208.6	193.5	184.7	148.5

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE													
	15	20	25	40	50	80	100	150	200	250	300	350	400	
400	J	J	J	J	E	E	E	E	E	E	E	E	A	
350	J	J	J	J	E	E	E	E	E	E	E	E	A	
300	J	J	J	J	E	E	E	E	E	E	E	A		
250	J	J	J	J	E	E	E	E	E	E	A			
200	J	J	J	J	E	E	E	E	E	A				
150	J	J	J	J	E	E	E	A						
100	J	J	J	J	E	E	A							
80	J	J	J	J	E	A								
50	J	J	J	B	A									
40	J	B	B	A										
25	B	B	A											
20	B	A												
15	A													

TABLE OF SCHEDULES

DN	SCHEDULE
15	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	160
250	160
300	160
350	160
400	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
E	BRANCH OUTLET
J	BRANCH FITTING

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	SOUR	PLANT	:	
CLASS NO. : 151055		CONSIGNEE	:	
ANS RATING : CLASS 1500		ENGINEERED BY :		
CORR. ALL. : 3 mm.		PRINCIPAL	:	
REV. LETTER : A		CONTR.JOB NO. :		
REV. DATE : 12/96		PROJECT NO. :		

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 151055, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIB	BRANCH FITTING B.W.END OUTLET	DN 15- 50	ASTM A105
BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWTG	THERMOWELL TAPERED	DN 50- 50	ASTM A182-F316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 151055, REV.A PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION	MESC														

* PIPE															
PIPE	74.30.03	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1	267.1	309.1	349.1	399.1	453.1	
* FLANGES															
BLIND FLANGE	76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1	
SPECTACLE BLIND FLANGE	76.88.37	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	
SPACER RING TYPE (ASME FLANGE)	76.88.46	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	
WELDING NECK FLANGE	76.62.79									978.1	980.1	982.1	984.1	986.1	
	76.62.80	032.1	034.1	036.1	038.1	040.1	044.1	046.1	048.1						
* FITTINGS															
CAP BUTT-WELD.END	76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1	
EQUAL TEE BUTT-WELD ENDS	76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1	
* VALVES															
CHECK VALVE BUTT-WELD ENDS	77.11.14	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE BUTT-WELD ENDS	77.21.14	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1	208.1									
GLOBE VALVE BUTT-WELD ENDS	77.31.14	203.1	204.1	205.1	207.1	208.1	210.1	212.1							
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1	532.1	534.1	
METER RUN	76.65.96	282.1	284.1	286.1	288.1										
ORIFICE FLANGE SET	76.62.95					140.1	144.1	146.1	148.1	978.1	980.1	982.1	984.1	986.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.66.142.1	30.67.142.1	30.88.040.1	400* 50	79.03.107.1			
25* 15		30.66.152.1	30.67.152.1	30.88.050.1	400* 80	79.03.120.1			
25* 20		30.66.162.1	30.67.162.1	30.88.060.1	400*100	79.03.131.1			
40* 15		30.66.172.1	30.67.172.1		400*150	79.03.142.1	29.47.760.1	29.62.760.1	
40* 20		30.66.182.1	30.67.182.1	30.88.080.1	400*200	79.03.278.1	30.66.459.1	30.67.459.1	30.88.484.1
40* 25		30.66.192.1	30.67.192.1	30.88.090.1	400*250	79.03.294.1	30.66.468.1	30.67.468.1	30.88.510.1
50* 20		30.66.195.1	30.67.195.1		400*300	79.03.308.1	30.66.480.1	30.67.480.1	30.88.536.1
50* 25		30.66.202.1	30.67.202.1		400*350	79.03.320.1	30.66.491.1	30.67.491.1	30.88.561.1
50* 40		30.66.212.1	30.67.212.1	30.88.117.1					
80* 40		30.66.232.1	30.67.232.1	30.88.126.1					
80* 50	79.03.680.1	30.66.242.1	30.67.242.1	30.88.135.1					
100* 40		30.66.260.1	30.67.260.1						
100* 50	79.03.682.1	30.66.272.1	30.67.272.1	30.88.156.1					
100* 80	79.03.694.1	30.66.282.1	30.67.282.1	30.88.168.1					
150* 50	79.03.684.1								
150* 80	79.03.696.1	30.66.302.1	30.67.302.1	30.88.180.1					
150*100	79.03.704.1	30.66.312.1	30.67.312.1	30.88.193.1					
200* 50	79.03.103.1								
200* 80	79.03.116.1								
200*100	79.03.127.1	30.66.332.1	30.67.332.1	30.88.222.1					
200*150	79.03.138.1	30.66.342.1	30.67.342.1	30.88.242.1					
250* 50	79.03.104.1								
250* 80	79.03.117.1								
250*100	79.03.128.1	29.47.354.1	29.62.354.1	30.88.268.1					
250*150	79.03.139.1	30.66.357.1	30.67.357.1	30.88.286.1					
250*200	79.03.272.1	30.66.370.1	30.67.370.1	30.88.296.1					
300* 50	79.03.105.1								
300* 80	79.03.118.1								
300*100	79.03.129.1								
300*150	79.03.140.1	29.47.470.1	29.62.470.1	30.88.325.1					
300*200	79.03.274.1	30.66.400.1	30.67.400.1	30.88.333.1					
300*250	79.03.290.1	30.66.410.1	30.67.410.1	30.88.355.1					
350* 50	79.03.106.1								
350* 80	79.03.119.1								
350*100	79.03.130.1								
350*150	79.03.141.1	29.47.612.1	29.62.612.1	30.88.387.1					
350*200	79.03.276.1	30.66.428.1	30.67.428.1	30.88.395.1					
350*250	79.03.292.1	30.66.441.1	30.67.441.1	30.88.420.1					
350*300	79.03.306.1	30.66.451.1	30.67.451.1	30.88.446.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-400	072.1	341.1
20	40-400	078.1	343.1
25	40-100	080.1	345.1
	150-400	084.1	346.1
40	50-100	086.1	350.1
	150-400	088.1	351.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.482.1			230 76.83.38.001.1
813	76.80.60.484.1			255 76.83.38.002.1
1219	76.80.60.486.1			305 76.83.38.003.1
1524	76.80.60.488.1			355 76.83.38.005.1
1829	76.80.60.490.1			405 76.83.38.006.1
2134	76.80.60.492.1			455 76.83.38.007.1
2438	76.80.60.494.1			
2743	76.80.60.496.1			
3048	76.80.60.498.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIB	BRANCH FITTING B.W.END OUTLET
BNIF	BRANCH FITTING FLANGED OUTLET
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	66.330.1	15	4	3/4	* 110	66.330.1
20	4	3/4	* 120	66.332.1	20	4	3/4	* 120	66.332.1
25	4	7/8	* 130	66.403.1	25	4	7/8	* 130	66.403.1
40	4	1	* 140	66.469.1	40	4	1	* 140	66.469.1
50	8	7/8	* 150	66.406.1					
80	8	1 1/8	* 180	66.533.1					
100	8	1 1/4	* 200	66.588.1					
150	12	1 3/8	* 260	66.649.1					
200	12	1 5/8	* 350	66.734.1					
250	12	1 7/8	* 400	66.798.1					
300	16	2	* 440	66.829.1					
350	16	2 1/4	* 480	66.861.1					
400	16	2 1/2	* 530	86.704.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	66.332.1
					20	4	3/4	* 130	66.334.1
					25	4	7/8	* 140	66.404.1
					40	4	1	* 160	66.472.1
50	8	7/8	* 160	66.407.1	50	8	7/8	* 170	66.409.1
80	8	1 1/8	* 190	66.535.1	80	8	1 1/8	* 210	66.538.1
100	8	1 1/4	* 210	66.595.1	100	8	1 1/4	* 230	66.598.1
150	12	1 3/8	* 280	66.652.1	150	12	1 3/8	* 300	66.655.1
200	12	1 5/8	* 360	66.736.1	200	12	1 5/8	* 400	66.741.1
250	12	1 7/8	* 420	66.802.1	250	12	1 7/8	* 460	66.806.1
300	16	2	* 460	66.834.1	300	16	2	* 510	86.562.1
350	16	2 1/4	* 500	86.631.1	350	16	2 1/4	* 560	86.637.1
400	16	2 1/2	* 550	86.706.1	400	16	2 1/2	* 620	86.713.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.203.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.80.032.1	
* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.204.1	
STUD BOLT WITH NUTS	4	81.38.66.332.1	
WELDING NECK FLANGE	1	76.62.80.034.1	
* DRAIN POINT	DN 20	FIG.0M	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.204.1	
STUD BOLT WITH NUTS	4	81.38.66.332.1	
WELDING NECK FLANGE	1	76.62.80.034.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	2	77.21.14.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
WELDING NECK FLANGE	2	76.62.80.032.1	
* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.80.032.1	
* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.14.203.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.80.032.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.04.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.66.330.1	
	8	81.38.66.330.1	
* TEMPERATURE INSTR.C.	DN 50	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.547.1	
GASKET, SPIRAL WOUND	1	85.41.46.514.1	
STUD BOLT WITH NUTS	8	81.38.66.474.1	
THERMOWELL TAPERED	L=230 MM	1	76.83.38.001.1
* TEMPERATURE INSTR.C.	DN 50	FIG.BB	DN150 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.547.1	
GASKET, SPIRAL WOUND	1	85.41.46.514.1	
STUD BOLT WITH NUTS	8	81.38.66.474.1	
THERMOWELL TAPERED	L=255 MM	1	76.83.38.002.1
* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.203.1	
STUD BOLT WITH NUTS	4	81.38.66.330.1	
WELDING NECK FLANGE	1	76.62.80.032.1	
* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.204.1	
STUD BOLT WITH NUTS	4	81.38.66.332.1	
WELDING NECK FLANGE	1	76.62.80.034.1	
* VENT POINT	DN 20	FIG.1M	DN 50 -400
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.14.204.1	
STUD BOLT WITH NUTS	4	81.38.66.332.1	
WELDING NECK FLANGE	1	76.62.80.034.1	

CLASS 151071

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	

PRESSURE BAR GA										
DN15 -200	255.4	250.4	231.9	226.0	219.1	208.6	193.5	184.7	167.1	

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	E	E A
150	C	C	C	C	E	E	E	A
100	C	C	C	C	E	E	A	
80	C	C	C	C	E	A		
50	C	C	C	B	A			
40	C	B	B	A				
25	B	B	A					
20	B	A						
15	A							

TABLE OF SCHEDULES

DN	SCHEDULE

15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 151071	CONSIGNEE	:	
ANS RATING : CLASS 1500	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-200	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-200	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-200	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-200	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-200	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-200	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-200	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE									
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200

* PIPE											
PIPE		74.30.05	020.1	030.1	040.1	060.1	073.1	113.1	161.1	227.1	267.1
PIPE NIPPLE 50MM		76.30.57	436.1	446.1	456.1	476.1					
* FLANGES											
BLIND FLANGE		76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1
SPECTACLE BLIND FLANGE		76.88.03	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1
WELDING NECK FLANGE		76.62.79	962.1	964.1	966.1	968.1	970.1	972.1	974.1	976.1	978.1
* FITTINGS											
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	062.1	082.1	102.1	122.1	145.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1
* VALVES											
CHECK VALVE BUTT-WELD ENDS		77.11.36	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1
GATE VALVE BUTT-WELD ENDS		77.21.36	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1
GATE VALVE FLANGED		77.20.76	203.1	204.1	205.1	207.1	208.1				
GLOBE VALVE BUTT-WELD ENDS		77.31.36	203.1	204.1	205.1	207.1	208.1	210.1	212.1		
* MISCELLANEOUS											
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1
METER RUN		76.65.96	282.1	284.1	286.1	288.1					
ORIFICE FLANGE SET		76.62.95					970.1	972.1	974.1	976.1	978.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		30.72.141.1	30.73.141.1	30.89.039.1
25* 15		30.72.151.1	30.73.151.1	30.89.049.1
25* 20		30.72.161.1	30.73.161.1	30.89.059.1
40* 15		30.72.171.1	30.73.171.1	30.89.069.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1
50* 20		29.46.195.1	29.61.195.1	
50* 25		30.72.201.1	30.73.201.1	
50* 40		30.72.211.1	30.73.211.1	30.89.116.1
80* 40		30.72.231.1	30.73.231.1	
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1
100* 40		30.72.259.1	30.73.259.1	
100* 50	79.03.182.1	30.72.271.1	30.73.271.1	30.89.155.1
100* 80	79.03.206.1	30.72.281.1	30.73.281.1	30.89.167.1
150* 50	79.03.184.1			
150* 80	79.03.208.1	30.72.301.1	30.73.301.1	30.89.179.1
150*100	79.03.230.1	30.72.311.1	30.73.311.1	30.89.192.1
200* 50	79.03.186.1			
200* 80	79.03.210.1			
200*100	79.03.232.1	30.72.331.1	30.73.331.1	30.89.208.1
200*150	79.03.252.1	30.72.341.1	30.73.341.1	30.89.228.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-200	321.1	016.1
20	40-200	323.1	018.1
25	40-100	325.1	020.1
	150-200	326.1	024.1
40	50-100	330.1	026.1
	150-200	331.1	028.1
50	80-100	336.1	
	150-200	337.1	

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.122.1		230	76.83.37.001.1
813	76.80.60.124.1		255	76.83.37.002.1
1219	76.80.60.126.1		305	76.83.37.003.1
1524	76.80.60.128.1		355	76.83.37.005.1
1829	76.80.60.130.1		405	76.83.37.006.1
2134	76.80.60.132.1		455	76.83.37.007.1
2438	76.80.60.134.1			
2743	76.80.60.136.1			
3048	76.80.60.138.1			

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 120	61.332.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	1 1/8	* 180	61.533.1					
100	8	1 1/4	* 200	61.588.1					
150	12	1 3/8	* 260	61.649.1					
200	12	1 5/8	* 350	61.734.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 170	61.409.1
80	8	1 1/8	* 190	61.535.1	80	8	1 1/8	* 210	61.538.1
100	8	1 1/4	* 210	61.595.1	100	8	1 1/4	* 230	61.598.1
150	12	1 3/8	* 280	61.652.1	150	12	1 3/8	* 300	61.655.1
200	12	1 5/8	* 360	61.736.1	200	12	1 5/8	* 400	61.741.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0M DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.408.1
GASKET, SPIRAL WOUND 1 85.41.46.504.1
GATE VALVE BUTT-WELD ENDS 1 77.21.36.203.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.79.962.1

* DRAIN POINT DN 20 FIG.0M DN 40 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 1 85.41.46.506.1
GATE VALVE BUTT-WELD ENDS 1 77.21.36.204.1
STUD BOLT WITH NUTS 4 81.38.61.332.1
WELDING NECK FLANGE 1 76.62.79.964.1

* ORIFICE INSTR.CONN. DN 15 FIG.0M DN 50 -200
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.504.1
GATE VALVE BUTT-WELD ENDS 2 77.21.36.203.1
LAP-JOINT FLANGE 2 76.62.20.508.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 2 76.62.79.962.1

* PRESSURE INSTR.CONN. DN 15 FIG.0M DN 15 -200
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.504.1
GATE VALVE BUTT-WELD ENDS 1 77.21.36.203.1
LAP-JOINT FLANGE 1 76.62.20.508.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.79.962.1

* METERRUN INSTR. CONN DN 15 FIG.0H DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 4 85.41.46.504.1
GATE VALVE FLANGED 2 77.20.76.203.1
LAP-JOINT FLANGE 2 76.62.20.508.1
STUD BOLT WITH NUTS 8 81.38.61.330.1
STUD BOLT WITH NUTS 8 81.38.61.330.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.537.1
GASKET, SPIRAL WOUND 1 85.41.46.512.1
STUD BOLT WITH NUTS 4 81.38.61.472.1
THERMOWELL TAPERED L=230 MM 1 76.83.37.001.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.537.1
GASKET, SPIRAL WOUND 1 85.41.46.512.1
STUD BOLT WITH NUTS 4 81.38.61.472.1
THERMOWELL TAPERED L=255 MM 1 76.83.37.002.1

* VENT POINT DN 15 FIG.1M DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.408.1
GASKET, SPIRAL WOUND 1 85.41.46.504.1
GLOBE VALVE BUTT-WELD ENDS 1 77.31.36.203.1
STUD BOLT WITH NUTS 4 81.38.61.330.1
WELDING NECK FLANGE 1 76.62.79.962.1

* VENT POINT DN 20 FIG.1M DN 40 -200
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.412.1
GASKET, SPIRAL WOUND 1 85.41.46.506.1
GLOBE VALVE BUTT-WELD ENDS 1 77.31.36.204.1
STUD BOLT WITH NUTS 4 81.38.61.332.1
WELDING NECK FLANGE 1 76.62.79.964.1

CLASS 151076

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS								
	0	100	150	200	250	300	350	400

	PRESSURE BAR GA							
DN15 -200	230.0	230.0	226.0	219.1	208.6	193.5	184.7	148.5

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE													
	15	20	25	40	50	80	100	150	200	250	300	350	400	
400	J	J	J	J	E	E	E	E	E	E	E	E	A	
350	J	J	J	J	E	E	E	E	E	E	E	E	A	
300	J	J	J	J	E	E	E	E	E	E	E	A		
250	J	J	J	J	E	E	E	E	E	E	A			
200	J	J	J	J	E	E	E	E	E	A				
150	J	J	J	J	E	E	E	A						
100	J	J	J	J	E	E	A							
80	J	J	J	J	E	A								
50	J	J	J	B	A									
40	J	B	B	A										
25	B	B	A											
20	B	A												
15	A													

TABLE OF SCHEDULES

DN	SCHEDULE
15	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	160
250	160
300	160
350	160
400	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
E	BRANCH OUTLET
J	BRANCH FITTING

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL	PLANT	:	
CLASS NO. : 151076	CONSIGNEE	:	
ANS RATING : CLASS 1500	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

DEP 31.38.01.12-GEN. CLASS 151076, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIB	BRANCH FITTING B.W.END OUTLET	DN 15- 50	ASTM A105
BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 50- 50	ASTM A182-F316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 151076, REV.A PAGE 3
ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION		MESC	NOMINAL PIPE SIZE												
			15	20	25	40	50	80	100	150	200	250	300	350	400

* PIPE															
PIPE		74.30.05	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1	267.1	309.1	349.1	399.1	453.1
PIPE NIPPLE	50MM	76.30.57	481.1	486.1	491.1	496.1									
* FLANGES															
BLIND FLANGE		76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1
SPECTACLE BLIND FLANGE		76.88.03	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
WELDING NECK FLANGE		76.62.79									978.1	980.1	982.1	984.1	986.1
		76.62.80	032.1	034.1	036.1	038.1	040.1	044.1	046.1	048.1					
* FITTINGS															
CAP BUTT-WELD.END		76.30.19	023.1	029.1	033.1	043.1	063.1	083.1	103.1	123.1	145.1	165.1	187.1	207.1	227.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1	695.1	715.1	737.1	757.1	777.1
* VALVES															
CHECK VALVE BUTT-WELD ENDS		77.11.36	353.1	354.1	355.1	357.1	358.1	360.1	362.1	364.1	215.1	216.1	217.1	218.1	219.1
GATE VALVE BUTT-WELD ENDS		77.21.36	353.1	354.1	355.1	357.1	358.1	360.1	362.1	364.1	215.1	216.1	217.1	218.1	219.1
GATE VALVE FLANGED		77.20.76	203.1	204.1	205.1	207.1	208.1								
GLOBE VALVE BUTT-WELD ENDS		77.31.36	353.1	354.1	355.1	357.1	358.1	360.1	362.1						
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1	532.1	534.1
METER RUN		76.65.96	282.1	284.1	286.1	288.1									
ORIFICE FLANGE SET		76.62.95					140.1	144.1	146.1	148.1	978.1	980.1	982.1	984.1	986.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.142.1	30.73.142.1	30.89.040.1	400* 50	79.03.107.1			
25* 15		30.72.152.1	30.73.152.1	30.89.050.1	400* 80	79.03.120.1			
25* 20		30.72.162.1	30.73.162.1	30.89.060.1	400*100	79.03.131.1			
40* 15		30.72.172.1	30.73.172.1	30.89.070.1	400*150	79.03.142.1	29.46.760.1	29.61.760.1	
40* 20		30.72.182.1	30.73.182.1	30.89.080.1	400*200	79.03.278.1	30.72.459.1	30.73.459.1	30.89.484.1
40* 25		30.72.192.1	30.73.192.1	30.89.090.1	400*250	79.03.294.1	30.72.468.1	30.73.468.1	30.89.510.1
50* 20		29.46.196.1	29.61.196.1		400*300	79.03.308.1	30.72.480.1	30.73.480.1	30.89.536.1
50* 25		30.72.202.1	30.73.202.1		400*350	79.03.320.1	30.72.491.1	30.73.491.1	30.89.561.1
50* 40		30.72.212.1	30.73.212.1	30.89.117.1					
80* 40		30.72.232.1	30.73.232.1						
80* 50	79.03.680.1	30.72.242.1	30.73.242.1	30.89.135.1					
100* 40		30.72.260.1	30.73.260.1						
100* 50	79.03.682.1	30.72.272.1	30.73.272.1	30.89.156.1					
100* 80	79.03.694.1	30.72.282.1	30.73.282.1	30.89.168.1					
150* 50	79.03.684.1								
150* 80	79.03.696.1	30.72.302.1	30.73.302.1	30.89.180.1					
150*100	79.03.704.1	30.72.312.1	30.73.312.1	30.89.193.1					
200* 50	79.03.103.1								
200* 80	79.03.116.1								
200*100	79.03.127.1	30.72.332.1	30.73.332.1						
200*150	79.03.138.1	30.72.342.1	30.73.342.1						
250* 50	79.03.104.1								
250* 80	79.03.117.1								
250*100	79.03.128.1	29.46.354.1	29.61.354.1						
250*150	79.03.139.1	30.72.357.1	30.73.357.1						
250*200	79.03.272.1	30.72.370.1	30.73.370.1	30.89.296.1					
300* 50	79.03.105.1								
300* 80	79.03.118.1								
300*100	79.03.129.1								
300*150	79.03.140.1	30.72.391.1	30.73.391.1						
300*200	79.03.274.1	30.72.400.1	30.73.400.1	30.89.333.1					
300*250	79.03.290.1	30.72.410.1	30.73.410.1	30.89.355.1					
350* 50	79.03.106.1								
350* 80	79.03.119.1								
350*100	79.03.130.1								
350*150	79.03.141.1	29.46.612.1	29.61.612.1						
350*200	79.03.276.1	30.72.428.1	30.73.428.1	30.89.395.1					
350*250	79.03.292.1	30.72.441.1	30.73.441.1	30.89.420.1					
350*300	79.03.306.1	30.72.451.1	30.73.451.1	30.89.446.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-400	072.1	341.1
20	40-400	078.1	343.1
25	40-100	080.1	345.1
	150-400	084.1	346.1
40	50-100	086.1	350.1
	150-400	088.1	351.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.122.1			230 76.83.38.001.1
813	76.80.60.124.1			255 76.83.38.002.1
1219	76.80.60.126.1			305 76.83.38.003.1
1524	76.80.60.128.1			355 76.83.38.005.1
1829	76.80.60.130.1			405 76.83.38.006.1
2134	76.80.60.132.1			455 76.83.38.007.1
2438	76.80.60.134.1			
2743	76.80.60.136.1			
3048	76.80.60.138.1			

COMP.	
NAME	DESCRIPTION
-----	-----
BNIB	BRANCH FITTING B.W.END OUTLET
BNIF	BRANCH FITTING FLANGED OUTLET
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	61.330.1	15	4	3/4	* 110	61.330.1
20	4	3/4	* 120	61.332.1	20	4	3/4	* 120	61.332.1
25	4	7/8	* 130	61.403.1	25	4	7/8	* 130	61.403.1
40	4	1	* 140	61.469.1	40	4	1	* 140	61.469.1
50	8	7/8	* 150	61.406.1					
80	8	1 1/8	* 180	61.533.1					
100	8	1 1/4	* 200	61.588.1					
150	12	1 3/8	* 260	61.649.1					
200	12	1 5/8	* 350	61.734.1					
250	12	1 7/8	* 400	61.798.1					
300	16	2	* 440	61.829.1					
350	16	2 1/4	* 480	61.861.1					
400	16	2 1/2	* 530	83.704.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	61.332.1
					20	4	3/4	* 130	61.334.1
					25	4	7/8	* 140	61.404.1
					40	4	1	* 160	61.472.1
50	8	7/8	* 160	61.407.1	50	8	7/8	* 170	61.409.1
80	8	1 1/8	* 190	61.535.1	80	8	1 1/8	* 210	61.538.1
100	8	1 1/4	* 210	61.595.1	100	8	1 1/4	* 230	61.598.1
150	12	1 3/8	* 280	61.652.1	150	12	1 3/8	* 300	61.655.1
200	12	1 5/8	* 360	61.736.1	200	12	1 5/8	* 400	61.741.1
250	12	1 7/8	* 420	61.802.1	250	12	1 7/8	* 460	61.806.1
300	16	2	* 460	61.834.1	300	16	2	* 510	83.562.1
350	16	2 1/4	* 500	83.631.1	350	16	2 1/4	* 560	83.637.1
400	16	2 1/2	* 550	83.706.1	400	16	2 1/2	* 620	83.713.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.36.353.1	
PIPE NIPPLE 50MM	1	76.30.57.481.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.80.032.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.36.354.1	
PIPE NIPPLE 50MM	1	76.30.57.486.1	
STUD BOLT WITH NUTS	4	81.38.61.332.1	
WELDING NECK FLANGE	1	76.62.80.034.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -200
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.36.354.1	
STUD BOLT WITH NUTS	4	81.38.61.332.1	
WELDING NECK FLANGE	1	76.62.80.034.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0I	DN 50 -200
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.76.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	
WELDING NECK FLANGE	2	76.62.80.032.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.36.353.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
PIPE NIPPLE 50MM	1	76.30.57.481.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.80.032.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -200
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.36.353.1	
LAP-JOINT FLANGE	1	76.62.20.508.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.80.032.1	

* METERRUN INSTR. CONN	DN 15	FIG.0H	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.20.76.203.1	
LAP-JOINT FLANGE	2	76.62.20.508.1	
STUD BOLT WITH NUTS	8	81.38.61.330.1	
	8	81.38.61.330.1	

* TEMPERATURE INSTR.C.	DN 50	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.547.1	
GASKET, SPIRAL WOUND	1	85.41.46.514.1	
STUD BOLT WITH NUTS	8	81.38.61.474.1	
THERMOWELL TAPERED L=230 MM	1	76.83.38.001.1	

* TEMPERATURE INSTR.C.	DN 50	FIG.BB	DN150 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.547.1	
GASKET, SPIRAL WOUND	1	85.41.46.514.1	
STUD BOLT WITH NUTS	8	81.38.61.474.1	
THERMOWELL TAPERED L=255 MM	1	76.83.38.002.1	

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.408.1	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.36.353.1	
PIPE NIPPLE 50MM	1	76.30.57.481.1	
STUD BOLT WITH NUTS	4	81.38.61.330.1	
WELDING NECK FLANGE	1	76.62.80.032.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.36.354.1	
PIPE NIPPLE 50MM	1	76.30.57.486.1	
STUD BOLT WITH NUTS	4	81.38.61.332.1	
WELDING NECK FLANGE	1	76.62.80.034.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -200
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.36.354.1	
STUD BOLT WITH NUTS	4	81.38.61.332.1	
WELDING NECK FLANGE	1	76.62.80.034.1	

CLASS 151261

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	

PRESSURE BAR GA										
DN15 -400	250.6	250.4	231.9	226.0	219.1	208.6	193.5	184.7	161.7	

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE									
	15	20	25	40	50	80	100	150	200	250 300 350 400
400	C	C	C	C	E	E	E	E	E	E E A
350	C	C	C	C	E	E	E	E	E	E E A
300	C	C	C	C	E	E	E	E	E	E A
250	C	C	C	C	E	E	E	E	E	A
200	C	C	C	C	E	E	E	E	A	
150	C	C	C	C	E	E	E	A		
100	C	C	C	C	E	E	A			
80	C	C	C	C	E	A				
50	C	C	C	B	A					
40	C	B	B	A						
25	B	B	A							
20	B	A								
15	A									

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160
350	160
400	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 151261	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-400	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-400	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-400	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GABB	GATE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLBB	GLOBE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
MTRR	METER RUN	DN 15- 40	AISI 316 LJ END FLANGES: ASTM A105
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 40- 40	AISI 316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE													
		15	20	25	40	50	80	100	150	200	250	300	350	400	
ITEM DESCRIPTION		MESC													

* PIPE															
PIPE		74.30.05	020.1	030.1	040.1	060.1	073.1	113.1	161.1	227.1	267.1	309.1	349.1	399.1	453.1
PIPE NIPPLE 50MM		76.30.57	436.1	446.1	456.1	476.1									
* FLANGES															
BLIND FLANGE		76.62.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1
SPECTACLE BLIND FLANGE		76.88.03	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1
WELDING NECK FLANGE		76.62.79	962.1	964.1	966.1	968.1	970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1
* FITTINGS															
CAP BUTT-WELD.END		76.30.19	022.1	028.1	032.1	042.1	062.1	082.1	102.1	122.1	145.1	165.1	187.1	207.1	227.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1	757.1	777.1
* VALVES															
CHECK VALVE BUTT-WELD ENDS		77.11.37	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
GATE VALVE BW BELLOWS SEALED		77.21.14	903.1	904.1	905.1	907.1									
GATE VALVE BUTT-WELD ENDS		77.21.54	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
GATE VALVE FLANGED		77.20.77	203.1	204.1	205.1	207.1	208.1								
GLOBE VALVE BW BELLOWS SEALED		77.31.14	903.1	904.1	905.1	907.1									
GLOBE VALVE BUTT-WELD ENDS		77.31.38	203.1	204.1	205.1	207.1	208.1	210.1	212.1						
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1	532.1	534.1
METER RUN		76.65.96	282.1	284.1	286.1	288.1									
ORIFICE FLANGE SET		76.62.95					970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		30.72.141.1	30.73.141.1	30.89.039.1	400* 50	79.03.194.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.03.218.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.03.240.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.03.260.1	29.46.744.1	29.61.744.1	30.89.466.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.03.278.1	30.72.459.1	30.73.459.1	30.89.484.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.03.294.1	30.72.468.1	30.73.468.1	30.89.510.1
50* 20		29.46.195.1	29.61.195.1		400*300	79.03.308.1	30.72.480.1	30.73.480.1	30.89.536.1
50* 25		30.72.201.1	30.73.201.1		400*350	79.03.320.1	30.72.491.1	30.73.491.1	30.89.561.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1					
80* 40		30.72.231.1	30.73.231.1						
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1					
100* 40		30.72.259.1	30.73.259.1						
100* 50	79.03.182.1	30.72.271.1	30.73.271.1	30.89.155.1					
100* 80	79.03.206.1	30.72.281.1	30.73.281.1	30.89.167.1					
150* 50	79.03.184.1								
150* 80	79.03.208.1	30.72.301.1	30.73.301.1	30.89.179.1					
150*100	79.03.230.1	30.72.311.1	30.73.311.1	30.89.192.1					
200* 50	79.03.186.1								
200* 80	79.03.210.1								
200*100	79.03.232.1	30.72.331.1	30.73.331.1	30.89.208.1					
200*150	79.03.252.1	30.72.341.1	30.73.341.1	30.89.228.1					
250* 50	79.03.188.1								
250* 80	79.03.212.1								
250*100	79.03.234.1	30.72.349.1	30.73.349.1	30.89.256.1					
250*150	79.03.254.1	30.72.360.1	30.73.360.1	30.89.274.1					
250*200	79.03.272.1	30.72.370.1	30.73.370.1	30.89.296.1					
300* 50	79.03.190.1								
300* 80	79.03.214.1								
300*100	79.03.236.1								
300*150	79.03.256.1	30.72.389.1	30.73.389.1	30.89.313.1					
300*200	79.03.274.1	30.72.400.1	30.73.400.1	30.89.333.1					
300*250	79.03.290.1	30.72.410.1	30.73.410.1	30.89.355.1					
350* 50	79.03.192.1								
350* 80	79.03.216.1								
350*100	79.03.238.1								
350*150	79.03.258.1	30.72.419.1	30.73.419.1	30.89.376.1					
350*200	79.03.276.1	30.72.428.1	30.73.428.1	30.89.395.1					
350*250	79.03.292.1	30.72.441.1	30.73.441.1	30.89.420.1					
350*300	79.03.306.1	30.72.451.1	30.73.451.1	30.89.446.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	321.1	016.1
20	40-400	323.1	018.1
25	40-100	325.1	020.1
	150-400	326.1	024.1
40	50-100	330.1	026.1
	150-400	331.1	028.1
50	80-100	336.1	
	150-250	337.1	
	300-400	338.1	

LEVEL DISPLACER CHAMBER			THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
356	76.80.60.122.1		230	76.83.37.001.1
813	76.80.60.124.1		255	76.83.37.002.1
1219	76.80.60.126.1		305	76.83.37.003.1
1524	76.80.60.128.1		355	76.83.37.005.1
1829	76.80.60.130.1		405	76.83.37.006.1
2134	76.80.60.132.1		455	76.83.37.007.1
2438	76.80.60.134.1			
2743	76.80.60.136.1			
3048	76.80.60.138.1			

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	3/4	* 110	15	4	3/4	* 110
20	4	3/4	* 120	20	4	3/4	* 120
25	4	7/8	* 130	25	4	7/8	* 130
40	4	1	* 140	40	4	1	* 140
50	8	7/8	* 150				
80	8	1 1/8	* 180				
100	8	1 1/4	* 200				
150	12	1 3/8	* 260				
200	12	1 5/8	* 350				
250	12	1 7/8	* 400				
300	16	2	* 440				
350	16	2 1/4	* 480				
400	16	2 1/2	* 530				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
				15	4	3/4	* 120
				20	4	3/4	* 130
				25	4	7/8	* 140
				40	4	1	* 160
50	8	7/8	* 160	50	8	7/8	* 170
80	8	1 1/8	* 190	80	8	1 1/8	* 210
100	8	1 1/4	* 210	100	8	1 1/4	* 230
150	12	1 3/8	* 280	150	12	1 3/8	* 300
200	12	1 5/8	* 360	200	12	1 5/8	* 400
250	12	1 7/8	* 420	250	12	1 7/8	* 460
300	16	2	* 460	300	16	2	* 510
350	16	2 1/4	* 500	350	16	2 1/4	* 560
400	16	2 1/2	* 550	400	16	2 1/2	* 620

ASSEMBLIES

* DRAIN POINT				DN 15 FIG.0N DN 15 - 25			
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
BLIND FLANGE				1 76.62.10.408.1			
GASKET, SPIRAL WOUND				1 85.41.46.504.1			
GATE VALVE BUTT-WELD ENDS				1 77.21.54.203.1			
PIPE NIPPLE 50MM				1 76.30.57.436.1			
STUD BOLT WITH NUTS				4 81.38.61.330.1			
WELDING NECK FLANGE				1 76.62.79.962.1			

* DRAIN POINT				DN 20 FIG.0N DN 40 - 40			
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
BLIND FLANGE				1 76.62.10.412.1			
GASKET, SPIRAL WOUND				1 85.41.46.506.1			
GATE VALVE BUTT-WELD ENDS				1 77.21.54.204.1			
PIPE NIPPLE 50MM				1 76.30.57.446.1			
STUD BOLT WITH NUTS				4 81.38.61.332.1			
WELDING NECK FLANGE				1 76.62.79.964.1			

* DRAIN POINT				DN 20 FIG.0M DN 50 -400			
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
BLIND FLANGE				1 76.62.10.412.1			
GASKET, SPIRAL WOUND				1 85.41.46.506.1			
GATE VALVE BUTT-WELD ENDS				1 77.21.54.204.1			
STUD BOLT WITH NUTS				4 81.38.61.332.1			
WELDING NECK FLANGE				1 76.62.79.964.1			

* ORIFICE INSTR.CONN.				DN 15 FIG.0M DN 50 -400			
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
GASKET, SPIRAL WOUND				2 85.41.46.504.1			
GATE VALVE BUTT-WELD ENDS				2 77.21.54.203.1			
LAP-JOINT FLANGE				2 76.62.20.508.1			
STUD BOLT WITH NUTS				4 81.38.61.330.1			
WELDING NECK FLANGE				2 76.62.79.962.1			

* PRESSURE INSTR.CONN.				DN 15 FIG.0N DN 15 - 25			
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
GASKET, SPIRAL WOUND				1 85.41.46.504.1			
GATE VALVE BUTT-WELD ENDS				1 77.21.54.203.1			
LAP-JOINT FLANGE				1 76.62.20.508.1			
PIPE NIPPLE 50MM				1 76.30.57.436.1			
STUD BOLT WITH NUTS				4 81.38.61.330.1			
WELDING NECK FLANGE				1 76.62.79.962.1			

* PRESSURE INSTR.CONN.				DN 15 FIG.0M DN 40 -400			
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
GASKET, SPIRAL WOUND				1 85.41.46.504.1			
GATE VALVE BUTT-WELD ENDS				1 77.21.54.203.1			
LAP-JOINT FLANGE				1 76.62.20.508.1			
STUD BOLT WITH NUTS				4 81.38.61.330.1			
WELDING NECK FLANGE				1 76.62.79.962.1			

* METERRUN INSTR. CONN				DN 15 FIG.0H DN 15 - 40			
Branch: (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
GASKET, SPIRAL WOUND				4 85.41.46.504.1			
GATE VALVE FLANGED				2 77.20.77.203.1			
LAP-JOINT FLANGE				2 76.62.20.508.1			
STUD BOLT WITH NUTS				8 81.38.61.330.1			
				8 81.38.61.330.1			

* TEMPERATURE INSTR.C.				DN 40 FIG.AA DN 80 -100			
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
COVER FLANGE THERMOWELL NOZZLE				1 76.62.60.537.1			
GASKET, SPIRAL WOUND				1 85.41.46.512.1			
STUD BOLT WITH NUTS				4 81.38.61.472.1			
THERMOWELL TAPERED				L=230 MM 1 76.83.37.001.1			

* TEMPERATURE INSTR.C.				DN 40 FIG.BB DN150 -400			
Branch:S (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
COVER FLANGE THERMOWELL NOZZLE				1 76.62.60.537.1			
GASKET, SPIRAL WOUND				1 85.41.46.512.1			
STUD BOLT WITH NUTS				4 81.38.61.472.1			
THERMOWELL TAPERED				L=255 MM 1 76.83.37.002.1			

* VENT POINT				DN 15 FIG.1N DN 15 - 25			
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
BLIND FLANGE				1 76.62.10.408.1			
GASKET, SPIRAL WOUND				1 85.41.46.504.1			
GLOBE VALVE BUTT-WELD ENDS				1 77.31.38.203.1			
PIPE NIPPLE 50MM				1 76.30.57.436.1			
STUD BOLT WITH NUTS				4 81.38.61.330.1			
WELDING NECK FLANGE				1 76.62.79.962.1			

* VENT POINT				DN 20 FIG.1N DN 40 - 40			
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
BLIND FLANGE				1 76.62.10.412.1			
GASKET, SPIRAL WOUND				1 85.41.46.506.1			
GLOBE VALVE BUTT-WELD ENDS				1 77.31.38.204.1			
PIPE NIPPLE 50MM				1 76.30.57.446.1			
STUD BOLT WITH NUTS				4 81.38.61.332.1			
WELDING NECK FLANGE				1 76.62.79.964.1			

* VENT POINT				DN 20 FIG.1M DN 50 -400			
Branch:N (:N=br.tab,:S=BNIF,: =N/A)				1(PIPING COMP.)			
BLIND FLANGE				1 76.62.10.412.1			
GASKET, SPIRAL WOUND				1 85.41.46.506.1			
GLOBE VALVE BUTT-WELD ENDS				1 77.31.38.204.1			
STUD BOLT WITH NUTS				4 81.38.61.332.1			
WELDING NECK FLANGE				1 76.62.79.964.1			

CLASS 152020

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS									
	0	50	100	150	200	250	300	350	400	450

	PRESSURE BAR GA									
DN15 -300	257.6	253.9	239.7	231.9	226.0	222.2	214.3	201.0	183.0	169.0

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.9
AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE										
	20		40		80		150		250		300
15	25	50	100	200	300						
300	C	C	C	C	E	E	E	E	E	E	A
250	C	C	C	C	E	E	E	E	E	E	A
200	C	C	C	C	E	E	E	E	E	A	
150	C	C	C	C	E	E	E	E	A		
100	C	C	C	C	E	E	E	A			
80	C	C	C	C	E	A					
50	C	C	C	B	A						
40	C	B	B	A							
25	B	B	A								
20	B	A									
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160

CODE EXPLANATION OF CHARACTERS

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

ALLOY STEEL (1.25CR-0.5MO)	PLANT :	
CLASS NO. : 152020	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : C	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A335-P11
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A335-P11

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F11
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F11
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F11
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A387-11
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A387-11
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F11

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A234-WP11
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WP11
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WP11
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A234-WP11

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	---	ASTM A182-F11
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F11
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F11
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A234-WP11
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A234-WP11
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 25	ASTM A234-WP11

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-300	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GABB	GATE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-300	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 50	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLBB	GLOBE VALVE BW BELLOWS SEALED	DN 15- 40	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-100	BODY: ASTM A217-WC6,A182-F11 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
MTRR	METER RUN	DN 15- 40	ASTM A182-F11/A335-P11
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F11
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/A194-4
TWTG	THERMOWELL TAPERED	DN 40- 40	AISI 316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.33.11	022.1	030.1	038.1	054.1	062.1	070.1	079.1	088.1	100.1	112.1	124.1
PIPE NIPPLE 50MM		76.32.57	436.1	446.1	456.1	476.1							
* FLANGES													
BLIND FLANGE		76.64.10	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1
SPECTACLE BLIND FLANGE		76.88.07	608.1	612.1	616.1	618.1	620.1	622.1	624.1	626.1	628.1	630.1	632.1
SPACER RING TYPE (ASME FLANGE)		76.88.18	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1
WELDING NECK FLANGE		76.64.79	786.1	788.1	790.1	792.1	794.1	796.1	798.1	800.1	804.1	806.1	808.1
* FITTINGS													
CAP BUTT-WELD.END		76.32.18	011.1	016.1	020.1	029.1	039.1	049.1	061.1	071.1	081.1	091.1	101.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	011.1	016.1	020.1	029.1	039.1	049.1	061.1	071.1	081.1	091.1	101.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.39	379.1	389.1	399.1	409.1	419.1	429.1	441.1	451.1	461.1	471.1	481.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	011.1	016.1	020.1	029.1	039.1	049.1	061.1	071.1	081.1	091.1	101.1
* VALVES													
CHECK VALVE BUTT-WELD ENDS		77.14.74	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1
GATE VALVE BW BELLOWS SEALED		77.24.64	903.1	904.1	905.1	907.1							
GATE VALVE BUTT-WELD ENDS		77.24.74	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1
GATE VALVE FLANGED		77.23.64	853.1	854.1	855.1	857.1	858.1						
GLOBE VALVE BW BELLOWS SEALED		77.34.64	903.1	904.1	905.1	907.1							
GLOBE VALVE BUTT-WELD ENDS		77.34.74	203.1	204.1	205.1	207.1	208.1	210.1	212.1				
* MISCELLANEOUS													
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1	526.1	528.1	530.1
METER RUN		76.64.95	162.1	164.1	166.1	168.1							
ORIFICE FLANGE SET		76.64.91					794.1	798.1	800.1	802.1	804.1	806.1	808.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		32.68.003.1	32.69.003.1	32.86.004.1
25* 15		32.68.013.1	32.69.013.1	32.86.012.1
25* 20		32.68.023.1	32.69.023.1	32.86.021.1
40* 15		32.68.033.1	32.69.033.1	
40* 20		32.68.043.1	32.69.043.1	
40* 25		32.68.053.1	32.69.053.1	
50* 20		32.68.068.1	32.69.068.1	
50* 25		32.68.073.1	32.69.073.1	
50* 40		32.68.083.1	32.69.083.1	
80* 40		32.68.093.1	32.69.093.1	
80* 50	79.27.180.1	32.68.103.1	32.69.103.1	
100* 40		32.68.118.1	32.69.118.1	
100* 50	79.27.182.1	32.68.127.1	32.69.127.1	
100* 80	79.27.206.1	32.68.142.1	32.69.142.1	
150* 50	79.27.184.1			
150* 80	79.27.208.1	32.68.157.1	32.69.157.1	
150*100	79.27.230.1	32.68.173.1	32.69.173.1	
200* 50	79.27.186.1			
200* 80	79.27.210.1			
200*100	79.27.232.1	32.68.193.1	32.69.193.1	
200*150	79.27.252.1	32.68.218.1	32.69.218.1	
250* 50	79.27.188.1			
250* 80	79.27.212.1			
250*100	79.27.234.1	32.68.243.1	32.69.243.1	
250*150	79.27.254.1	32.68.258.1	32.69.258.1	
250*200	79.27.272.1	32.68.274.1	32.69.274.1	
300* 50	79.27.190.1			
300* 80	79.27.214.1			
300*100	79.27.236.1			
300*150	79.27.256.1	32.68.288.1	32.69.288.1	
300*200	79.27.274.1	32.68.294.1	32.69.294.1	
300*250	79.27.290.1	32.68.304.1	32.69.304.1	

		BNIP
		76.80.31
BRANCH	RUN-PIPE	
15	40-300	166.1
20	40-300	168.1
25	40-100	170.1
	150-300	174.1
40	50-100	176.1
	150-300	178.1

	THERMOWELL
LENGTH	MESCNUMBER
230	76.83.37.001.1
255	76.83.37.002.1
305	76.83.37.003.1
355	76.83.37.005.1
405	76.83.37.006.1
455	76.83.37.007.1

COMP.	
NAME	DESCRIPTION
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	96.330.1	15	4	3/4	* 110	96.330.1
20	4	3/4	* 120	96.332.1	20	4	3/4	* 120	96.332.1
25	4	7/8	* 130	96.403.1	25	4	7/8	* 130	96.403.1
40	4	1	* 140	96.469.1	40	4	1	* 140	96.469.1
50	8	7/8	* 150	96.406.1					
80	8	1 1/8	* 180	96.533.1					
100	8	1 1/4	* 200	96.588.1					
150	12	1 3/8	* 260	96.649.1					
200	12	1 5/8	* 350	96.734.1					
250	12	1 7/8	* 400	96.798.1					
300	16	2	* 440	96.829.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	96.332.1
					20	4	3/4	* 130	96.334.1
					25	4	7/8	* 140	96.404.1
					40	4	1	* 160	96.472.1
50	8	7/8	* 160	96.407.1	50	8	7/8	* 170	96.409.1
80	8	1 1/8	* 190	96.535.1	80	8	1 1/8	* 210	96.538.1
100	8	1 1/4	* 210	96.595.1	100	8	1 1/4	* 230	96.598.1
150	12	1 3/8	* 280	96.652.1	150	12	1 3/8	* 300	96.655.1
200	12	1 5/8	* 360	96.736.1	200	12	1 5/8	* 400	96.741.1
250	12	1 7/8	* 420	96.802.1	250	12	1 7/8	* 460	96.808.1
300	16	2	* 460	96.833.1	300	16	2	* 510	96.839.1

ASSEMBLIES

* DRAIN POINT					DN 15 FIG.0N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
BLIND FLANGE					1 76.64.10.408.1				
GASKET, SPIRAL WOUND					1 85.41.46.504.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.74.203.1				
PIPE NIPPLE 50MM					1 76.32.57.436.1				
STUD BOLT WITH NUTS					4 81.38.96.330.1				
WELDING NECK FLANGE					1 76.64.79.786.1				

* DRAIN POINT					DN 20 FIG.0N DN 40 - 40				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
BLIND FLANGE					1 76.64.10.412.1				
GASKET, SPIRAL WOUND					1 85.41.46.506.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.74.204.1				
PIPE NIPPLE 50MM					1 76.32.57.446.1				
STUD BOLT WITH NUTS					4 81.38.96.332.1				
WELDING NECK FLANGE					1 76.64.79.788.1				

* DRAIN POINT					DN 20 FIG.0M DN 50 -300				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
BLIND FLANGE					1 76.64.10.412.1				
GASKET, SPIRAL WOUND					1 85.41.46.506.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.74.204.1				
STUD BOLT WITH NUTS					4 81.38.96.332.1				
WELDING NECK FLANGE					1 76.64.79.788.1				

* ORIFICE INSTR.CONN.					DN 15 FIG.0M DN 50 -300				
Branch: (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
GASKET, SPIRAL WOUND					2 85.41.46.504.1				
GATE VALVE BUTT-WELD ENDS					2 77.24.74.203.1				
LAP-JOINT FLANGE					2 76.64.20.258.1				
STUD BOLT WITH NUTS					4 81.38.96.330.1				
WELDING NECK FLANGE					2 76.64.79.786.1				

* PRESSURE INSTR.CONN.					DN 15 FIG.0N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
GASKET, SPIRAL WOUND					1 85.41.46.504.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.74.203.1				
LAP-JOINT FLANGE					1 76.64.20.258.1				
PIPE NIPPLE 50MM					1 76.32.57.436.1				
STUD BOLT WITH NUTS					4 81.38.96.330.1				
WELDING NECK FLANGE					1 76.64.79.786.1				

* PRESSURE INSTR.CONN.					DN 15 FIG.0M DN 40 -300				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
GASKET, SPIRAL WOUND					1 85.41.46.504.1				
GATE VALVE BUTT-WELD ENDS					1 77.24.74.203.1				
LAP-JOINT FLANGE					1 76.64.20.258.1				
STUD BOLT WITH NUTS					4 81.38.96.330.1				
WELDING NECK FLANGE					1 76.64.79.786.1				

* METERRUN INSTR. CONN					DN 15 FIG.0H DN 15 - 40				
Branch: (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
GASKET, SPIRAL WOUND					4 85.41.46.504.1				
GATE VALVE FLANGED					2 77.23.64.853.1				
LAP-JOINT FLANGE					2 76.64.20.258.1				
STUD BOLT WITH NUTS					8 81.38.96.330.1				
					8 81.38.96.330.1				

* TEMPERATURE INSTR.C.					DN 40 FIG.AA DN 80 -100				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
COVER FLANGE THERMOWELL NOZZLE					1 76.64.60.987.1				
GASKET, SPIRAL WOUND					1 85.41.46.512.1				
STUD BOLT WITH NUTS					4 81.38.96.472.1				
THERMOWELL TAPERED					L=230 MM 1 76.83.37.001.1				

* TEMPERATURE INSTR.C.					DN 40 FIG.BB DN150 -300				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
COVER FLANGE THERMOWELL NOZZLE					1 76.64.60.987.1				
GASKET, SPIRAL WOUND					1 85.41.46.512.1				
STUD BOLT WITH NUTS					4 81.38.96.472.1				
THERMOWELL TAPERED					L=255 MM 1 76.83.37.002.1				

* VENT POINT					DN 15 FIG.1N DN 15 - 25				
Branch:N (:N=br.tab,:S=BNIF,: =N/A)					1(PIPING COMP.)				
BLIND FLANGE					1 76.64.10.408.1				
GASKET, SPIRAL WOUND					1 85.41.46.504.1				
GLOBE VALVE BUTT-WELD ENDS					1 77.34.74.203.1				
PIPE NIPPLE 50MM					1 76.32.57.436.1				
STUD BOLT WITH NUTS					4 81.38.96.330.1				
WELDING NECK FLANGE					1 76.64.79.786.1				

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)			
BLIND FLANGE	1	76.64.10.412.1	
GASKET, SPIRAL WOUND	1	85.41.46.506.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.74.204.1	
PIPE NIPPLE 50MM	1	76.32.57.446.1	
STUD BOLT WITH NUTS	4	81.38.96.332.1	
WELDING NECK FLANGE	1	76.64.79.788.1	

CLASS 153050

DESIGN LIMITS										
TEMPERATURE IN DEGREES CELSIUS										
	0	50	100	150	200	250	300	350	400	450
PRESSURE BAR GA										
DN15 -50	236.8	233.7	220.5	204.8	191.4	179.5	170.4	163.7	157.7	154.0
DN80 -100	190.7	190.7	190.7	190.7	190.7	179.5	170.4	163.7	157.7	154.0

- NOTES
- - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES							
RUN SIZE	BRANCHSIZE						
	15	20	25	40	50	80	100
100	C	C	C	C	E	E	A
80	C	C	C	C	E	A	
50	C	C	C	B	A		
40	C	B	B	A			
25	B	B	A				
20	B	A					
15	A						

TABLE OF SCHEDULES	
DN	SCHEDULE
15	80S
20	80S
25	80S
40	80S
50	80S
80	80S
100	80S

CODE	EXPLANATION OF CHARACTERS
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			
STAINL STEEL AISI 321/347	PLANT	:	
CLASS NO. : 153050	CONSIGNEE	:	
ANS RATING : CLASS 1500	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : C	CONTR.JOB NO.	:	
REV. DATE : 12/98	PROJECT NO.	:	
ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-100	ASTM A312-TP321/347

* FLANGES

BLFL	BLIND FLANGE	DN 15-100	ASTM A182-F321/347
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F321/347
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F321/347
SBFL	SPECTACLE BLIND FLANGE	DN 15-100	ASTM A240-TP321/347
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-100	ASTM A240-TP321/347
WNFL	WELDING NECK FLANGE	DN 15-100	ASTM A182-F321/347

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-100	ASTM A403-WP321/347
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A403-WP321/347
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A403-WP321/347
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-100	ASTM A403-WP321/347

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321/347
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321/347
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-100	ASTM A182-F321/347
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A403-WP321/347
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A403-WP321/347
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A403-WP321/347

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-100	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-100	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-100	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP321/347
MTRR	METER RUN	DN 15- 40	AISI 321/347
ORFS	ORIFICE FLANGE SET	DN 50-100	ASTM A182-F321/347
STBT	STUD BOLT WITH NUTS	---	ASTM A453-GR.660 CLASS A
TWTG	THERMOWELL TAPERED	DN 40- 40	AISI 316

PIPING COMPONENTS

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 ISSUE DATE : JANUARY 1999

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE						
		15	20	25	40	50	80	100

* PIPE								
PIPE	74.36.15	020.1	028.1	036.1	052.1	060.1	068.1	076.1
* FLANGES								
BLIND FLANGE	76.65.10	262.1	264.1	266.1	268.1	270.1	272.1	274.1
SPECTACLE BLIND FLANGE	76.88.09	558.1	562.1	566.1	568.1	570.1	572.1	574.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	908.1	912.1	916.1	918.1	920.1	922.1	924.1
WELDING NECK FLANGE	76.65.80	382.1	384.1	386.1	388.1	390.1	392.1	394.1
* FITTINGS								
CAP BUTT-WELD.END	76.33.18	038.1	048.1	058.1	078.1	088.1	108.1	128.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.38	038.1	048.1	058.1	078.1	088.1	108.1	128.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.39	538.1	548.1	558.1	578.1	588.1	608.1	628.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	038.1	048.1	058.1	078.1	088.1	108.1	128.1
* VALVES								
CHECK VALVE FLANGED	77.13.20	203.1	204.1	205.1	207.1	208.1	210.1	212.1
GATE VALVE FLANGED	77.23.20	203.1	204.1	205.1	207.1	208.1	210.1	212.1
GLOBE VALVE FLANGED	77.33.20	203.1	204.1	205.1	207.1	208.1	210.1	212.1
* MISCELLANEOUS								
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1
METER RUN	76.65.96	832.1	834.1	836.1	838.1			
ORIFICE FLANGE SET	76.65.95					390.1	392.1	394.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.69.068.1	33.71.068.1	33.85.020.1
25* 15		33.69.078.1	33.71.078.1	33.85.030.1
25* 20		33.69.088.1	33.71.088.1	33.85.040.1
40* 15		33.69.098.1	33.71.098.1	33.85.044.1
40* 20		33.69.118.1	33.71.118.1	33.85.050.1
40* 25		33.69.128.1	33.71.128.1	33.85.060.1
50* 20		33.69.131.1	33.71.131.1	
50* 25		33.69.138.1	33.71.138.1	
50* 40		33.69.148.1	33.71.148.1	36.89.138.1
80* 40		33.69.178.1	33.71.178.1	
80* 50	79.74.360.1	33.69.188.1	33.71.188.1	
100* 40		33.69.194.1	33.71.194.1	
100* 50	79.74.362.1	33.69.208.1	33.71.208.1	
100* 80	79.74.386.1	33.69.218.1	33.71.218.1	

		BNIF	BNIP
		76.80.40	76.80.31
BRANCH	RUN-PIPE		
15	40-100	641.1	602.1
20	40- 80	643.1	606.1
	100-100	644.1	608.1
25	40- 40	645.1	609.1
	50- 50	646.1	610.1
	80-100	647.1	611.1
40	50- 50	650.1	614.1
	80- 80	651.1	615.1
	100-100	652.1	616.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.61.922.1			230 76.83.37.001.1
813	76.80.61.924.1			255 76.83.37.002.1
1219	76.80.61.926.1			305 76.83.37.003.1
1524	76.80.61.928.1			355 76.83.37.005.1
1829	76.80.61.930.1			405 76.83.37.006.1
2134	76.80.61.932.1			455 76.83.37.007.1
2438	76.80.61.934.1			
2743	76.80.61.936.1			
3048	76.80.61.938.1			

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	74.330.1	15	4	3/4	* 110	74.330.1
20	4	3/4	* 120	74.332.1	20	4	3/4	* 120	74.332.1
25	4	7/8	* 130	74.403.1	25	4	7/8	* 130	74.403.1
40	4	1	* 140	74.469.1	40	4	1	* 140	74.469.1
50	8	7/8	* 150	74.406.1					
80	8	1 1/8	* 180	74.533.1					
100	8	1 1/4	* 200	74.607.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
					15	4	3/4	* 120	74.332.1
					20	4	3/4	* 130	74.334.1
					25	4	7/8	* 140	74.404.1
					40	4	1	* 160	74.472.1
50	8	7/8	* 160	74.407.1	50	8	7/8	* 170	74.409.1
80	8	1 1/8	* 190	74.535.1	80	8	1 1/8	* 210	74.538.1
100	8	1 1/4	* 210	74.595.1	100	8	1 1/4	* 230	74.598.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.262.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.20.203.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.80.382.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.264.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.20.204.1	
STUD BOLT WITH NUTS	8	81.38.74.332.1	
WELDING NECK FLANGE	1	76.65.80.384.1	

* DRAIN POINT	DN 20	FIG.OH	DN 50 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.264.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.20.204.1	
STUD BOLT WITH NUTS	8	81.38.74.332.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.OI	DN 50 -100
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.20.203.1	
LAP-JOINT FLANGE	2	76.65.20.608.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
	8	81.38.74.330.1	
WELDING NECK FLANGE	2	76.65.80.382.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.20.203.1	
LAP-JOINT FLANGE	1	76.65.20.608.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
	4	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.80.382.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OH	DN 40 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GATE VALVE FLANGED	1	77.23.20.203.1	
LAP-JOINT FLANGE	1	76.65.20.608.1	
STUD BOLT WITH NUTS	4	81.38.74.330.1	
	4	81.38.74.330.1	

* METERRUN INSTR. CONN	DN 15	FIG.OH	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	4	85.41.46.504.1	
GATE VALVE FLANGED	2	77.23.20.203.1	
LAP-JOINT FLANGE	2	76.65.20.608.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
	8	81.38.74.330.1	

* TEMPERATURE INSTR.C.	DN 40	FIG.AA	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.65.60.687.1	
GASKET, SPIRAL WOUND	1	85.41.46.512.1	
STUD BOLT WITH NUTS	4	81.38.74.472.1	
THERMOWELL TAPERED L=230 MM	1	76.83.37.001.1	

* VENT POINT	DN 15	FIG.1I	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.262.1	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
GLOBE VALVE FLANGED	1	77.33.20.203.1	
STUD BOLT WITH NUTS	8	81.38.74.330.1	
WELDING NECK FLANGE	1	76.65.80.382.1	

* VENT POINT	DN 20	FIG.1I	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.264.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.33.20.204.1	
STUD BOLT WITH NUTS	8	81.38.74.332.1	
WELDING NECK FLANGE	1	76.65.80.384.1	

* VENT POINT	DN 20	FIG.1H	DN 50 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.264.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GLOBE VALVE FLANGED	1	77.33.20.204.1	
STUD BOLT WITH NUTS	8	81.38.74.332.1	

PIPING CLASSES ASME RATING 2500

CLASS 251011

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
0	200	250	300	350	400	

PRESSURE BAR GA						
DN15 -300	257.6	257.6	245.9	228.5	217.4	166.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE										
	15	20	25	40	50	80	100	150	200	250	300
300	C	C	C	C	E	E	E	B	B	B	A
250	C	C	C	C	E	E	E	B	B	A	
200	C	C	C	C	E	E	B	B	A		
150	C	C	C	C	E	B	B	A			
100	C	C	C	C	B	B	A				
80	C	C	C	B	B	A					
50	C	C	C	B	A						
40	C	B	B	A							
25	B	B	A								
20	B	A									
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL	PLANT	:	
CLASS NO. : 251011	CONSIGNEE	:	
ANS RATING : CLASS 2500	ENGINEERED BY :		
CORR. ALL. : 1 mm.	PRINCIPAL :		
REV. LETTER : B	CONTR.JOB NO. :		
REV. DATE : 12/98	PROJECT NO. :		

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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* PIPE

PIPE	PIPE	DN 15-300	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A234-WPB

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 50- 50	ASTM A182-F316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE										
ITEM DESCRIPTION	MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE												
PIPE	74.30.05	020.1	030.1	040.1	060.1	073.1	113.1	161.1	227.1	267.1	309.1	349.1
PIPE NIPPLE 50MM	76.30.57	436.1	446.1	456.1	476.1							
* FLANGES												
BLIND FLANGE	76.62.10	472.1	474.1	476.1	478.1	480.1	484.1	486.1	488.1	490.1	492.1	494.1
SPECTACLE BLIND FLANGE	76.88.03	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1
SPACER RING TYPE (ASME FLANGE)	76.88.16	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1
WELDING NECK FLANGE	76.62.80	002.1	004.1	006.1	008.1	010.1	012.1	014.1	016.1	018.1	020.1	022.1
* FITTINGS												
CAP BUTT-WELD.END	76.30.19	022.1	028.1	032.1	042.1	062.1	082.1	102.1	122.1	145.1	165.1	187.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	572.1	578.1	582.1	592.1	612.1	632.1	652.1	672.1	695.1	715.1	737.1
* VALVES												
CHECK VALVE FLANGED	77.10.20					258.1	260.1	262.1	264.1	265.1	266.1	267.1
	77.10.56	253.1	254.1	255.1	257.1							
GATE VALVE BUTT-WELD ENDS	77.24.80	253.1	254.1	255.1	257.1							
GATE VALVE FLANGED	77.20.20					258.1	260.1	262.1	264.1	265.1	266.1	267.1
	77.20.78	253.1	254.1	255.1	257.1							
GLOBE VALVE BUTT-WELD ENDS	77.31.53	353.1	354.1	355.1	357.1							
GLOBE VALVE FLANGED	77.30.20					258.1	260.1	262.1				
	77.30.56	253.1	254.1	255.1	257.1							
* MISCELLANEOUS												
GASKET, SPIRAL WOUND	85.41.46	554.1	556.1	558.1	562.1	564.1	568.1	570.1	574.1	576.1	578.1	580.1
ORIFICE FLANGE SET	76.62.95					170.1	172.1	174.1	176.1	178.1	180.1	182.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		30.72.141.1	30.73.141.1	30.89.039.1
25* 15		30.72.151.1	30.73.151.1	30.89.049.1
25* 20		30.72.161.1	30.73.161.1	30.89.059.1
40* 15		30.72.171.1	30.73.171.1	30.89.069.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1
50* 20		29.46.195.1	29.61.195.1	
50* 25		30.72.201.1	30.73.201.1	
50* 40		30.72.211.1	30.73.211.1	30.89.116.1
80* 40		30.72.231.1	30.73.231.1	
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1
100* 40		30.72.259.1	30.73.259.1	
100* 50	79.03.182.1	30.72.271.1	30.73.271.1	30.89.155.1
100* 80	79.03.206.1	30.72.281.1	30.73.281.1	30.89.167.1
150* 50	79.03.184.1			
150* 80	79.03.208.1	30.72.301.1	30.73.301.1	30.89.179.1
150*100	79.03.230.1	30.72.311.1	30.73.311.1	30.89.192.1
200* 50	79.03.186.1			
200* 80	79.03.210.1			
200*100	79.03.232.1	30.72.331.1	30.73.331.1	30.89.208.1
200*150	79.03.252.1	30.72.341.1	30.73.341.1	30.89.228.1
250* 50	79.03.188.1			
250* 80	79.03.212.1			
250*100	79.03.234.1	30.72.349.1	30.73.349.1	30.89.256.1
250*150	79.03.254.1	30.72.360.1	30.73.360.1	30.89.274.1
250*200	79.03.272.1	30.72.370.1	30.73.370.1	30.89.296.1
300* 50	79.03.190.1			
300* 80	79.03.214.1			
300*100	79.03.236.1			
300*150	79.03.256.1	30.72.389.1	30.73.389.1	30.89.313.1
300*200	79.03.274.1	30.72.400.1	30.73.400.1	30.89.333.1
300*250	79.03.290.1	30.72.410.1	30.73.410.1	30.89.355.1

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-300	421.1	016.1
20	40-300	423.1	018.1
25	40-100	425.1	020.1
	150-300	426.1	024.1
40	50-100	430.1	026.1
	150-300	431.1	028.1
50	80-100	436.1	
	150-250	437.1	
	300-300	438.1	

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.38.001.1
255	76.83.38.002.1
305	76.83.38.003.1
355	76.83.38.005.1
405	76.83.38.006.1
455	76.83.38.007.1

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET ORIFICE FLANGES

ASSEMBLIES

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81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 130	61.334.1					
20	4	3/4	* 130	61.334.1					
25	4	7/8	* 140	61.404.1					
40	4	1 1/8	* 170	61.532.1					
50	8	1	* 180	61.475.1	50	8	1	* 190	61.477.1
80	8	1 1/4	* 220	61.597.1	80	8	1 1/4	* 230	61.598.1
100	8	1 1/2	* 300	61.696.1	100	8	1 1/2	* 320	61.700.1
150	8	2	* 410	61.825.1	150	8	2	* 420	61.827.1
200	12	2	* 450	61.831.1	200	12	2	* 460	61.834.1
250	12	2 1/2	* 570	83.708.1	250	12	2 1/2	* 570	83.708.1
300	12	2 3/4	* 630	83.784.1	300	12	2 3/4	* 640	83.785.1

BOLTSET SPECTACLE/SPACER

81.38				
DN	NR	INCH	* MM	
15	4	3/4	* 140	61.335.1
20	4	3/4	* 140	61.335.1
25	4	7/8	* 160	61.407.1
40	4	1 1/8	* 190	61.535.1
50	8	1	* 210	61.480.1
80	8	1 1/4	* 260	61.603.1
100	8	1 1/2	* 350	61.704.1
150	8	2	* 460	61.834.1
200	12	2	* 510	83.562.1
250	12	2 1/2	* 640	83.715.1
300	12	2 3/4	* 720	83.793.1

* DRAIN POINT DN 15 FIG.OM DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.472.1
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BUTT-WELD ENDS 1 77.24.80.253.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.002.1

* DRAIN POINT DN 20 FIG.OM DN 40 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 1 85.41.46.556.1
GATE VALVE BUTT-WELD ENDS 1 77.24.80.254.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.004.1

* ORIFICE INSTR.CONN. DN 15 FIG.OM DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
GATE VALVE BUTT-WELD ENDS 2 77.24.80.253.1
LAP-JOINT FLANGE 2 76.62.20.558.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 2 76.62.80.002.1

* PRESSURE INSTR.CONN. DN 15 FIG.ON DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BUTT-WELD ENDS 1 77.24.80.253.1
LAP-JOINT FLANGE 1 76.62.20.558.1
PIPE NIPPLE 50MM 1 76.30.57.436.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.002.1

* PRESSURE INSTR.CONN. DN 15 FIG.OM DN 40 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BUTT-WELD ENDS 1 77.24.80.253.1
LAP-JOINT FLANGE 1 76.62.20.558.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.002.1

* TEMPERATURE INSTR.C. DN 50 FIG.BB DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.549.1
GASKET, SPIRAL WOUND 1 85.41.46.564.1
STUD BOLT WITH NUTS 8 81.38.61.480.1
THERMOWELL TAPERED L=255 MM 1 76.83.38.002.1

* TEMPERATURE INSTR.C. DN 50 FIG.CC DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE 1 76.62.60.549.1
GASKET, SPIRAL WOUND 1 85.41.46.564.1
STUD BOLT WITH NUTS 8 81.38.61.480.1
THERMOWELL TAPERED L=305 MM 1 76.83.38.003.1

* VENT POINT DN 15 FIG.1M DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.472.1
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GLOBE VALVE BUTT-WELD ENDS 1 77.31.53.353.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.002.1

* VENT POINT DN 20 FIG.1M DN 40 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 1 85.41.46.556.1
GLOBE VALVE BUTT-WELD ENDS 1 77.31.53.354.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.004.1

CLASS 251031

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	0	200	250	300	350	400

	PRESSURE BAR GA					
DN15 -300	313.5	313.5	299.3	278.1	264.6	202.4

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - NOMINAL PIPE SIZE DN15 TO BE AVOIDED WHERE POSSIBLE, (INSIDE DIAMETER IS ONLY 6.4 MM.)
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE										
	15	20	25	40	50	80	100	150	200	250	300
300	J	J	J	J	E	E	E	E	E	E	A
250	J	J	J	J	E	E	E	E	E	E	A
200	J	J	J	J	E	E	E	E	E	A	
150	J	J	J	J	E	E	E	E	A		
100	J	J	J	J	E	E	E	A			
80	J	J	J	J	E	A					
50	J	J	J	B	A						
40	J	B	B	A							
25	B	B	A								
20	B	A									
15	A										

TABLE OF SCHEDULES

DN	SCHEDULE

15	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	24.0
200	30.0
250	36.0
300	42.0

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
E	BRANCH OUTLET
J	BRANCH FITTING

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL		PLANT	:
CLASS NO. : 251031		CONSIGNEE	:
ANS RATING : CLASS 2500		ENGINEERED BY	:
CORR. ALL. : 3 mm.		PRINCIPAL	:
REV. LETTER : A		CONTR.JOB NO.	:
REV. DATE : 12/98		PROJECT NO.	:

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A106-B
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A516-60
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A516-60
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A105

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A234-WPB
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A234-WPB

* REDUCING FITTINGS

BNIB	BRANCH FITTING B.W.END OUTLET	DN 15- 50	ASTM A105
BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A105
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A234-WPB
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A234-WPB
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A234-WPB

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50- 50	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),STELLITE 6
		DN 50-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 50- 50	ASTM A182-F316

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 251031, REV.A PAGE 3
 ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.30.00								110.1	146.1	186.1	238.1
		74.30.05	022.1	032.1	042.1	062.1	075.1	115.1	163.1				
PIPE NIPPLE 50MM		76.30.57	481.1	486.1	491.1	496.1							
* FLANGES													
BLIND FLANGE		76.62.10	472.1	474.1	476.1	478.1	480.1	484.1	486.1	488.1	490.1	492.1	494.1
SPECTACLE BLIND FLANGE		76.88.03	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1
SPACER RING TYPE (ASME FLANGE)		76.88.16	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1
WELDING NECK FLANGE		76.62.80	052.1	054.1	056.1	058.1	060.1	064.1	066.1				
		76.62.85								110.1	146.1	186.1	238.1
* FITTINGS													
CAP BUTT-WELD.END		76.30.19	023.1	029.1	033.1	043.1	063.1	083.1	103.1				
		76.30.22								110.1	146.1	186.1	238.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	573.1	579.1	583.1	593.1	613.1	633.1	653.1				
		76.30.44								110.1	146.1	186.1	238.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	573.1	579.1	583.1	593.1	613.1	633.1	653.1				
		76.30.46								110.1	146.1	186.1	238.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	573.1	579.1	583.1	593.1	613.1	633.1	653.1				
		76.30.90								110.1	146.1	186.1	238.1
* VALVES													
CHECK VALVE BUTT-WELD ENDS		77.11.20					258.1	260.1	262.1	264.1	265.1	266.1	267.1
		77.11.53	253.1	254.1	255.1	257.1							
GATE VALVE BUTT-WELD ENDS		77.21.20					258.1	260.1	262.1	264.1	265.1	266.1	267.1
		77.21.55	453.1	454.1	455.1	457.1							
GATE VALVE FLANGED		77.20.20					258.1						
		77.20.78	253.1	254.1	255.1	257.1							
GLOBE VALVE BUTT-WELD ENDS		77.31.20					258.1	260.1	262.1				
		77.31.53	253.1	254.1	255.1	257.1							
* MISCELLANEOUS													
GASKET, SPIRAL WOUND		85.41.46	554.1	556.1	558.1	562.1	564.1	568.1	570.1	574.1	576.1	578.1	580.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		30.72.142.1	30.73.142.1	30.89.040.1
25* 15		30.72.152.1	30.73.152.1	30.89.050.1
25* 20		30.72.162.1	30.73.162.1	30.89.060.1
40* 15		30.72.172.1	30.73.172.1	30.89.070.1
40* 20		30.72.182.1	30.73.182.1	30.89.080.1
40* 25		30.72.192.1	30.73.192.1	30.89.090.1
50* 20		29.46.196.1	29.61.196.1	
50* 25		30.72.202.1	30.73.202.1	
50* 40		30.72.212.1	30.73.212.1	30.89.117.1
80* 40		30.72.232.1	30.73.232.1	
80* 50	79.03.680.1	30.72.242.1	30.73.242.1	30.89.135.1
100* 40		30.72.260.1	30.73.260.1	
100* 50	79.03.682.1	30.72.272.1	30.73.272.1	30.89.156.1
100* 80	79.03.694.1	30.72.282.1	30.73.282.1	30.89.168.1
150* 50	79.08.030.1			
150* 80	79.08.275.1	30.62.106.1	30.63.106.1	30.93.106.1
150*100	79.08.530.1	30.62.135.1	30.63.135.1	30.93.135.1
200* 80	79.08.303.1			
200*100	79.08.558.1	30.62.169.1	30.63.169.1	30.93.169.1
200*150	79.08.779.1	30.62.203.1	30.63.203.1	30.93.203.1
250* 50	79.08.093.1			
250* 80	79.08.353.1			
250*100	79.08.593.1	30.62.256.1	30.63.256.1	30.93.239.1
250*150	79.08.794.1	30.62.285.1	30.63.285.1	30.93.285.1
250*200	79.08.854.1	30.62.336.1	30.63.336.1	30.93.336.1
300* 50	79.08.144.1			
300* 80	79.08.404.1			
300*100	79.08.654.1			
300*150	79.08.808.1	30.62.387.1	30.63.387.1	30.93.387.1
300*200	79.08.869.1	30.62.450.1	30.63.450.1	30.93.450.1
300*250	79.08.914.1	30.62.513.1	30.63.513.1	30.93.513.1

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-300	072.1	441.1
20	40-300	078.1	443.1
25	40-100	080.1	445.1
	150-300	084.1	446.1
40	50-100	086.1	450.1
	150-300	088.1	451.1
50	80-100		456.1
	150-250		457.1
	300-300		458.1

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.38.001.1
255	76.83.38.002.1
305	76.83.38.003.1
355	76.83.38.005.1
405	76.83.38.006.1
455	76.83.38.007.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIB	BRANCH FITTING B.W.END OUTLET
BNIF	BRANCH FITTING FLANGED OUTLET
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET SPECTACLE/SPACER

				81.38					81.38
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 130	61.334.1	15	4	3/4	* 140	61.335.1
20	4	3/4	* 130	61.334.1	20	4	3/4	* 140	61.335.1
25	4	7/8	* 140	61.404.1	25	4	7/8	* 160	61.407.1
40	4	1 1/8	* 170	61.532.1	40	4	1 1/8	* 190	61.535.1
50	8	1	* 180	61.475.1	50	8	1	* 210	61.480.1
80	8	1 1/4	* 220	61.597.1	80	8	1 1/4	* 260	61.603.1
100	8	1 1/2	* 300	61.696.1	100	8	1 1/2	* 350	61.704.1
150	8	2	* 410	61.825.1	150	8	2	* 460	61.834.1
200	12	2	* 450	61.831.1	200	12	2	* 510	83.562.1
250	12	2 1/2	* 570	83.708.1	250	12	2 1/2	* 640	83.715.1
300	12	2 3/4	* 630	83.784.1	300	12	2 3/4	* 720	83.793.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.472.1	
GASKET, SPIRAL WOUND	1	85.41.46.554.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.55.453.1	
PIPE NIPPLE 50MM	1	76.30.57.481.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.62.80.052.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.474.1	
GASKET, SPIRAL WOUND	1	85.41.46.556.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.55.454.1	
PIPE NIPPLE 50MM	1	76.30.57.486.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.62.80.054.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.474.1	
GASKET, SPIRAL WOUND	1	85.41.46.556.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.55.454.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.62.80.054.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.554.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.55.453.1	
LAP-JOINT FLANGE	1	76.62.20.558.1	
PIPE NIPPLE 50MM	1	76.30.57.481.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.62.80.052.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.554.1	
GATE VALVE BUTT-WELD ENDS	1	77.21.55.453.1	
LAP-JOINT FLANGE	1	76.62.20.558.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.62.80.052.1	

* TEMPERATURE INSTR.C.	DN 50	FIG.BB	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.549.1	
GASKET, SPIRAL WOUND	1	85.41.46.564.1	
STUD BOLT WITH NUTS	8	81.38.61.480.1	
THERMOWELL TAPERED	L=255 MM	1	76.83.38.002.1

* TEMPERATURE INSTR.C.	DN 50	FIG.CC	DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.549.1	
GASKET, SPIRAL WOUND	1	85.41.46.564.1	
STUD BOLT WITH NUTS	8	81.38.61.480.1	
THERMOWELL TAPERED	L=305 MM	1	76.83.38.003.1

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.472.1	
GASKET, SPIRAL WOUND	1	85.41.46.554.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.53.253.1	
PIPE NIPPLE 50MM	1	76.30.57.481.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.62.80.052.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.474.1	
GASKET, SPIRAL WOUND	1	85.41.46.556.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.53.254.1	
PIPE NIPPLE 50MM	1	76.30.57.486.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.62.80.054.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.474.1	
GASKET, SPIRAL WOUND	1	85.41.46.556.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.31.53.254.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.62.80.054.1	

CLASS 251076

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
0	200	250	300	350	400	

PRESSURE BAR GA						
DN15 -500	247.2	247.2	236.0	219.3	208.7	159.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE														
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500
500	J	J	J	J	E	E	E	E	E	B	B	B	B	B	A
450	J	J	J	J	E	E	E	E	E	B	B	B	B	A	
400	J	J	J	J	E	E	E	E	B	B	B	B	A		
350	J	J	J	J	E	E	E	E	B	B	B	B	A		
300	J	J	J	J	E	E	E	B	B	B	A				
250	J	J	J	J	E	E	E	B	B	A					
200	J	J	J	J	E	E	B	B	A						
150	J	J	J	J	E	B	B	A							
100	J	J	J	J	B	B	A								
80	J	J	J	B	B	A									
50	J	J	J	B	A										
40	J	B	B	A											
25	B	B	A												
20	B	A													
15	A														

TABLE OF SCHEDULES

DN	SCHEDULE
15	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	26.0
250	30.0
300	36.0
350	38.0
400	44.0
450	48.0
500	52.0

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
E	BRANCH OUTLET
J	BRANCH FITTING

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 251076	CONSIGNEE	:	
ANS RATING : CLASS 2500	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

DEP 31.38.01.12-GEN. CLASS 251076, REV.A PAGE 2
ISSUE DATE : JANUARY 1999

* PIPE

PIPE PIPE DN 15-500 ASTM A106-B

* FLANGES

BLFL BLIND FLANGE DN 15-300 ASTM A105
LJFL LAP-JOINT FLANGE --- ASTM A105
SBFL SPECTACLE BLIND FLANGE DN 15-300 ASTM A516-60
SPRT SPACER RING TYPE (ASME FLANGE) DN 15-300 ASTM A516-60
WNFL WELDING NECK FLANGE DN 15-300 ASTM A105

* FITTINGS

CAPB CAP BUTT-WELD.END DN 15-500 ASTM A234-WPB
E45B ELBOW 45 DEG BUTT-WELD ENDS DN 15-500 ASTM A234-WPB
E90B ELBOW 90 DEG BUTT-WELD ENDS DN 15-500 ASTM A234-WPB
TEEB EQUAL TEE BUTT-WELD ENDS DN 15-500 ASTM A234-WPB

* REDUCING FITTINGS

BNIB BRANCH FITTING B.W.END OUTLET DN 15- 50 ASTM A105
BROB BRANCH OUTLET RED. BUTT WELD DN 80-500 ASTM A105
RECB REDUCER CONC BUTT WELD ENDS DN 20-500 ASTM A234-WPB
REEB REDUCER ECC BUTT WELD ENDS DN 20-500 ASTM A234-WPB
TERB TEE REDUCING BUTT WELD ENDS DN 20-500 ASTM A234-WPB

* VALVES

CHSB CHECK VALVE BW. SPECIAL CLASS DN 15-150 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316,STELLITE 6
GASB GATE VALVE BW SPECIAL CLASS DN 15-150 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316(L),STELLITE 6
GLSB GLOBE VALVE BW. SPECIAL CLASS DN 15-100 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND DN 15-300 AISI 316(L),GRAPHITE FILLED
CS CENTRING-/SS INNER RING
STBT STUD BOLT WITH NUTS DN902-920 ASTM A193-B7/A194-2H

PIPING COMPONENTS

DEP 31.38.01.12-GEN. CLASS 251076, REV.A PAGE 3
ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	

* PIPE																		
PIPE	74.30.01										142.1	180.1	232.1	290.1	352.1	422.1	500.1	
	74.30.03	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1									
* FLANGES																		
BLIND FLANGE	76.62.10	472.1	474.1	476.1	478.1	480.1	484.1	486.1	488.1	490.1	492.1	494.1						
SPECTACLE BLIND FLANGE	76.88.37	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1						
SPACER RING TYPE (ASME FLANGE)	76.88.46	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1						
WELDING NECK FLANGE	76.62.80	052.1	054.1	056.1	058.1	060.1	064.1	066.1	068.1									
	76.62.85									142.1	180.1	232.1						
* FITTINGS																		
CAP BUTT-WELD.END	76.30.16										142.1	180.1	232.1	290.1	352.1	422.1	500.1	
	76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1									
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1									
	76.30.45									142.1	180.1	232.1	290.1	352.1	442.1	500.1		
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1									
	76.30.47									142.1	180.1	232.1	290.1	352.1	422.1	500.1		
EQUAL TEE BUTT-WELD ENDS	76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1									
	76.30.91									142.1	180.1	232.1	290.1	352.1	422.1	500.1		
* VALVES																		
CHECK VALVE BW. SPECIAL CLASS	77.11.36	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1									
GATE VALVE BW SPECIAL CLASS	77.21.36	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1									
GLOBE VALVE BW. SPECIAL CLASS	77.31.36	553.1	554.1	555.1	557.1	558.1	560.1	562.1										
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND	85.41.46	554.1	556.1	558.1	562.1	564.1	568.1	570.1	574.1	576.1	578.1	580.1						

RUN* BR	BROB	RECB	REEB	TERB									BNIB	
	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.80.31	
													BRANCH	RUN-PIPE
20* 15		30.66.142.1	30.67.142.1	30.88.040.1	400* 50	79.08.241.1							15	40-500
25* 15		30.66.152.1	30.67.152.1	30.88.050.1	400* 80	79.08.501.1							20	40-500
25* 20		30.66.162.1	30.67.162.1	30.88.060.1	400*100	79.08.751.1							25	40-100
40* 15		30.66.172.1	30.67.172.1		400*150	79.08.834.1	30.64.764.1	30.65.764.1	30.94.753.1					150-500
40* 20		30.66.182.1	30.67.182.1	30.88.080.1	400*200		30.64.809.1	30.65.809.1	30.94.805.1				40	50-100
40* 25		30.66.192.1	30.67.192.1	30.88.090.1	400*250		30.64.858.1	30.65.858.1	30.94.853.1					150-500
50* 20		30.66.195.1	30.67.195.1		400*300		30.64.904.1	30.65.904.1	30.94.904.1					
50* 25		30.66.202.1	30.67.202.1		400*350		30.64.953.1	30.65.953.1	30.94.953.1					
50* 40		30.66.212.1	30.67.212.1	30.88.117.1	450* 50	79.08.234.1								
80* 40		30.66.232.1	30.67.232.1	30.88.126.1	450* 80	79.08.510.1								
80* 50	79.03.680.1	30.66.242.1	30.67.242.1	30.88.135.1	450*100	79.08.766.1								
100* 40		30.66.260.1	30.67.260.1		450*150	79.08.836.1								
100* 50	79.03.682.1	30.66.272.1	30.67.272.1	30.88.156.1	450*200	79.08.905.1	30.59.032.1	30.68.032.1	30.97.016.1					
100* 80	79.03.694.1	30.66.282.1	30.67.282.1	30.88.168.1	450*250		30.59.055.1	30.68.055.1	30.97.056.1					
150* 50	79.03.684.1				450*300		30.59.106.1	30.68.106.1	30.97.106.1					
150* 80	79.03.696.1	30.66.302.1	30.67.302.1	30.88.180.1	450*350		30.59.061.1	30.68.061.1	30.97.156.1					
150*100	79.03.704.1	30.66.312.1	30.67.312.1	30.88.193.1	450*400		30.59.207.1	30.68.207.1	30.97.207.1					
200* 50	79.08.061.1				500* 50	79.08.230.1								
200* 80	79.08.301.1				500* 80	79.08.514.1								
200*100		30.64.163.1	30.65.163.1	30.94.163.1	500*100	79.08.759.1								
200*150		30.64.197.1	30.65.197.1	30.94.197.1	500*150	79.08.838.1								
250* 50	79.08.090.1				500*200	79.08.899.1	30.59.294.1	30.68.394.1						
250* 80	79.08.350.1				500*250		30.29.324.1	30.68.324.1	30.97.301.1					
250*100	79.08.590.1	30.64.248.1	30.65.248.1		500*300		30.59.352.1	30.68.352.1	30.97.351.1					
250*150		30.64.276.1	30.65.276.1	30.94.276.1	500*350		30.59.401.1	30.68.401.1	30.97.401.1					
250*200		30.64.327.1	30.65.327.1	30.94.327.1	500*400		30.59.353.1	30.68.353.1	30.97.452.1					
300* 50	79.08.141.1				500*450		30.59.354.1	30.68.354.1	30.97.502.1					
300* 80	79.08.401.1													
300*100	79.08.651.1													
300*150		30.64.378.1	30.65.378.1	30.94.378.1										
300*200		30.64.441.1	30.65.441.1	30.94.441.1										
300*250		30.64.502.1	30.65.502.1	30.94.503.1										
350* 50	79.08.200.1													
350* 80	79.08.450.1													
350*100	79.08.700.1													
350*150	79.08.818.1	30.64.561.1	30.65.561.1											
350*200		30.64.616.1	30.65.616.1	30.94.616.1										
350*250		30.64.662.1	30.65.662.1	30.94.662.1										
350*300		30.64.709.1	30.65.709.1	30.94.708.1										

COMP.	
NAME	DESCRIPTION
BNIB	BRANCH FITTING B.W.END OUTLET
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	3/4	*	130	15	4	3/4	*	140
20	4	3/4	*	130	20	4	3/4	*	140
25	4	7/8	*	140	25	4	7/8	*	160
40	4	1 1/8	*	170	40	4	1 1/8	*	190
50	8	1	*	180	50	8	1	*	210
80	8	1 1/4	*	220	80	8	1 1/4	*	260
100	8	1 1/2	*	300	100	8	1 1/2	*	350
150	8	2	*	410	150	8	2	*	460
200	12	2	*	450	200	12	2	*	510
250	12	2 1/2	*	570	250	12	2 1/2	*	640
300	12	2 3/4	*	630	300	12	2 3/4	*	720
				81.334.1					81.335.1
				61.334.1					61.335.1
				61.404.1					61.407.1
				61.532.1					61.535.1
				61.475.1					61.480.1
				61.597.1					61.603.1
				61.696.1					61.704.1
				61.825.1					61.834.1
				61.831.1					83.562.1
				83.708.1					83.715.1
				83.784.1					83.793.1

ASSEMBLIES

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* DRAIN POINT DN 15 FIG.0M DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.472.1
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BW SPECIAL CLASS 1 77.21.36.553.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.052.1

* DRAIN POINT DN 20 FIG.0M DN 40 -500
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 1 85.41.46.556.1
GATE VALVE BW SPECIAL CLASS 1 77.21.36.554.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.054.1

* PRESSURE INSTR.CONN. DN 15 FIG.0M DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BW SPECIAL CLASS 1 77.21.36.553.1
LAP-JOINT FLANGE 1 76.62.20.558.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PRESSURE INSTR.CONN. DN 15 FIG.0M DN 40 -500
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BW SPECIAL CLASS 1 77.21.36.553.1
LAP-JOINT FLANGE 1 76.62.20.558.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.052.1

* VENT POINT DN 15 FIG.1M DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.472.1
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GLOBE VALVE BW. SPECIAL CLASS 1 77.31.36.553.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.052.1

* VENT POINT DN 20 FIG.1M DN 40 -500
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 1 85.41.46.556.1
GLOBE VALVE BW. SPECIAL CLASS 1 77.31.36.554.1
STUD BOLT WITH NUTS 4 81.38.61.334.1
WELDING NECK FLANGE 1 76.62.80.054.1

CLASS 252050

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	0	100	150	200	400	450	500	538

	PRESSURE BAR GA							
DN15 -300	257.6	237.5	231.8	230.6	230.5	193.5	148.4	100.1

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR TEMPERATURE POINTS A BRANCH OUTLET (DN 50) SHALL BE USED FOR NOMINAL PIPE SIZES DN 80 AND ABOVE.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - BOLT DIAMETER LIMITED TO 2 INCH

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE											
	20			40			80			150		
	15	25	50	100	200	300	15	25	50	100	200	300
300	C	C	C	C	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	B	B	A		
200	C	C	C	C	E	E	B	B	A			
150	C	C	C	C	E	B	B	A				
100	C	C	C	C	B	B	A					
80	C	C	C	B	B	A						
50	C	C	C	B	A							
40	C	B	B	A								
25	B	B	A									
20	B	A										
15	A											

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

ALLOY STEEL (2.25CR-1.0MO)	PLANT	:	
CLASS NO. : 252050	CONSIGNEE	:	
ANS RATING : CLASS 2500	ENGINEERED BY :		
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO. :		
REV. DATE : 12/96	PROJECT NO. :		

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A335-P22
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A335-P22

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F22-CL3
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F22-CL3
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A387-22
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A387-22
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F22-CL3

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A234-WP22
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WP22
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A234-WP22
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A234-WP22

* REDUCING FITTINGS

BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F22-CL3
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F22-CL3
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A234-WP22
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A234-WP22
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A234-WP22

* VALVES

CHSB	CHECK VALVE BW. SPECIAL CLASS	DN 15-300	BODY: ASTM A182-F22-CL3 TRIM: AISI 316(L),STELLITE 6
GASB	GATE VALVE BW SPECIAL CLASS	DN 15-300	BODY: ASTM A182-F22-CL3 TRIM: AISI 316(L),STELLITE 6
GLSB	GLOBE VALVE BW. SPECIAL CLASS	DN 15-100	BODY: ASTM A182-F22-CL3 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 321/347,GRAPHITE FILLED SS CENTRING/INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F22-CL3
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B16/194-8C
TWWG	THERMOWELL WELDED HIGH PRESS.	DN 50- 50	ASTM A182-F22-CL3

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.33.21	022.1	030.1	038.1	054.1	062.1	070.1	079.1	088.1	100.1	112.1	124.1
PIPE NIPPLE 50MM		76.32.57	536.1	546.1	561.1	576.1							
* FLANGES													
BLIND FLANGE		76.64.12	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1	530.1	532.1
SPECTACLE BLIND FLANGE		76.88.07	858.1	862.1	866.1	868.1	870.1	872.1	874.1	876.1	878.1	880.1	882.1
SPACER RING TYPE (ASME FLANGE)		76.88.49	258.1	262.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1
WELDING NECK FLANGE		76.64.81	888.1	890.1	892.1	894.1	896.1	898.1	900.1	902.1	904.1	906.1	908.1
* FITTINGS													
CAP BUTT-WELD.END		76.32.18	512.1	518.1	521.1	531.1	541.1	551.1	561.1	571.1	581.1	591.1	601.1
ELBOW 45 DEG BUTT-WELD ENDS		76.32.38	501.1	511.1	521.1	531.1	541.1	551.1	561.1	571.1	581.1	591.1	601.1
ELBOW 90 DEG BUTT-WELD ENDS		76.32.40	701.1	711.1	721.1	731.1	741.1	751.1	761.1	771.1	781.1	791.1	801.1
EQUAL TEE BUTT-WELD ENDS		76.32.84	501.1	511.1	521.1	531.1	541.1	551.1	561.1	571.1	581.1	591.1	601.1
* VALVES													
CHECK VALVE BW. SPECIAL CLASS		77.14.73	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1
GATE VALVE BW SPECIAL CLASS		77.24.73	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1	216.1	217.1
GLOBE VALVE BW. SPECIAL CLASS		77.34.73	203.1	204.1	205.1	207.1	208.1	210.1	212.1				
* MISCELLANEOUS													
GASKET, SPIRAL WOUND		85.41.45	254.1	256.1	258.1	262.1	264.1	268.1	270.1	274.1	276.1	278.1	280.1
ORIFICE FLANGE SET		76.64.93					374.1	378.1	380.1	382.1	384.1	386.1	388.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		32.72.003.1	32.73.003.1	32.87.004.1
25* 15		32.72.006.1	32.73.006.1	32.87.012.1
25* 20		32.72.009.1	32.73.009.1	32.87.021.1
40* 15		31.69.015.1	31.72.015.1	32.87.028.1
40* 20		32.72.013.1	32.73.013.1	32.87.036.1
40* 25		32.72.017.1	32.73.017.1	32.87.045.1
50* 20		31.69.019.1	31.72.019.1	32.87.052.1
50* 25		32.72.021.1	32.73.021.1	32.87.060.1
50* 40		32.72.030.1	32.73.030.1	32.87.068.1
80* 40		32.72.049.1	32.73.049.1	32.87.076.1
80* 50	79.39.180.1	32.72.059.1	32.73.059.1	32.87.084.1
100* 40		31.69.065.1	31.72.065.1	
100* 50	79.39.182.1	32.72.069.1	32.73.069.1	
100* 80	79.39.206.1	32.72.079.1	32.73.079.1	32.87.108.1
150* 50	79.39.184.1			
150* 80	79.39.208.1	32.72.089.1	32.73.089.1	32.87.122.1
150*100	79.39.230.1	32.72.101.1	32.73.101.1	32.87.132.1
200* 50	79.39.186.1			
200* 80	79.39.210.1			
200*100	79.39.232.1	32.72.111.1	32.73.111.1	32.87.142.1
200*150	79.39.252.1	32.72.121.1	32.73.121.1	32.87.152.1
250* 50	79.39.188.1			
250* 80	79.39.212.1			
250*100	79.39.234.1	31.69.123.1	31.72.123.1	32.87.162.1
250*150	79.39.254.1	32.72.124.1	32.73.124.1	32.87.172.1
250*200	79.39.272.1	32.72.129.1	32.73.129.1	32.87.184.1
300* 50	79.39.190.1			
300* 80	79.39.214.1			
300*100	79.39.236.1			
300*150	79.39.256.1	31.69.131.1	31.72.131.1	32.87.194.1
300*200	79.39.274.1	32.72.134.1	32.73.134.1	32.87.204.1
300*250	79.39.290.1	32.72.141.1	32.73.141.1	32.87.214.1

		BNIP
		76.80.31
BRANCH	RUN-PIPE	
15	40-300	196.1
20	40-300	198.1
25	40-100	200.1
	150-300	204.1
40	50-100	206.1
	150-300	208.1

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
115	76.83.43.001.1
135	76.83.43.002.1
165	76.83.43.003.1

COMP.	
NAME	DESCRIPTION
-----	-----
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	3/4	*	130	97.334.1				
20	4	3/4	*	130	97.334.1				
25	4	7/8	*	140	97.404.1				
40	4	1 1/8	*	170	97.532.1				
50	8	1	*	180	97.475.1	50	8	1	* 190 97.477.1
80	8	1 1/4	*	220	97.597.1	80	8	1 1/4	* 230 97.598.1
100	8	1 1/2	*	300	97.696.1	100	8	1 1/2	* 320 97.700.1
150	8	2	*	410	97.825.1	150	8	2	* 420 97.827.1
200	12	2	*	450	97.831.1	200	12	2	* 460 97.833.1

BOLTSET SPECTACLE/SPACER

81.38				
DN	NR	INCH	*	MM
15	4	3/4	*	140 97.335.1
20	4	3/4	*	140 97.335.1
25	4	7/8	*	160 97.407.1
40	4	1 1/8	*	190 97.535.1
50	8	1	*	210 97.480.1
80	8	1 1/4	*	260 97.603.1
100	8	1 1/2	*	350 97.704.1
150	8	2	*	460 97.833.1
200	12	2	*	510 84.562.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0N DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.12.508.1
GASKET, SPIRAL WOUND 1 85.41.45.254.1
GATE VALVE BW SPECIAL CLASS 1 77.24.73.203.1
PIPE NIPPLE 50MM 1 76.32.57.536.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 1 76.64.81.888.1

* DRAIN POINT DN 20 FIG.0N DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.12.512.1
GASKET, SPIRAL WOUND 1 85.41.45.256.1
GATE VALVE BW SPECIAL CLASS 1 77.24.73.204.1
PIPE NIPPLE 50MM 1 76.32.57.546.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 1 76.64.81.890.1

* DRAIN POINT DN 20 FIG.0M DN 50 -300
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.12.512.1
GASKET, SPIRAL WOUND 1 85.41.45.256.1
GATE VALVE BW SPECIAL CLASS 1 77.24.73.204.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 1 76.64.81.890.1

* ORIFICE INSTR.CONN. DN 15 FIG.0M DN 50 -300
Branch: (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.45.254.1
GATE VALVE BW SPECIAL CLASS 2 77.24.73.203.1
LAP-JOINT FLANGE 2 76.64.19.258.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 2 76.64.81.888.1

* PRESSURE INSTR.CONN. DN 15 FIG.0N DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.45.254.1
GATE VALVE BW SPECIAL CLASS 1 77.24.73.203.1
LAP-JOINT FLANGE 1 76.64.19.258.1
PIPE NIPPLE 50MM 1 76.32.57.536.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 1 76.64.81.888.1

* PRESSURE INSTR.CONN. DN 15 FIG.0M DN 40 -300
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.45.254.1
GATE VALVE BW SPECIAL CLASS 1 77.24.73.203.1
LAP-JOINT FLANGE 1 76.64.19.258.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 1 76.64.81.888.1

* TEMPERATURE INSTR.C. DN 50 FIG.WA DN 80 - 80
Branch: (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
THERMOWELL WELDED L=115 MM 1 76.83.43.001.1

* TEMPERATURE INSTR.C. DN 50 FIG.WB DN100 -100
Branch: (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
THERMOWELL WELDED L=135 MM 1 76.83.43.002.1

* TEMPERATURE INSTR.C. DN 50 FIG.WC DN150 -300
Branch: (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
THERMOWELL WELDED L=165 MM 1 76.83.43.003.1

* VENT POINT DN 15 FIG.1N DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.12.508.1
GASKET, SPIRAL WOUND 1 85.41.45.254.1
GLOBE VALVE BW. SPECIAL CLASS 1 77.34.73.203.1
PIPE NIPPLE 50MM 1 76.32.57.536.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 1 76.64.81.888.1

* VENT POINT DN 20 FIG.1N DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.12.512.1
GASKET, SPIRAL WOUND 1 85.41.45.256.1
GLOBE VALVE BW. SPECIAL CLASS 1 77.34.73.204.1
PIPE NIPPLE 50MM 1 76.32.57.546.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 1 76.64.81.890.1

* VENT POINT DN 20 FIG.1M DN 50 -300
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.64.12.512.1
GASKET, SPIRAL WOUND 1 85.41.45.256.1
GLOBE VALVE BW. SPECIAL CLASS 1 77.34.73.204.1
STUD BOLT WITH NUTS 4 81.38.97.334.1
WELDING NECK FLANGE 1 76.64.81.890.1

CLASS 253021

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS							
		0	50	150	200	250	300	350	400

		PRESSURE BAR GA							
DN15 -300		223.4	223.4	223.4	208.5	195.3	183.9	175.5	168.4

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE											
	15	20	25	40	50	80	100	150	200	250	300	
300	C	C	C	C	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	B	B	A		
200	C	C	C	C	E	E	B	B	A			
150	C	C	C	C	E	B	B	A				
100	C	C	C	C	B	B	A					
80	C	C	C	B	B	A						
50	C	C	C	B	A							
40	C	B	B	A								
25	B	B	A									
20	B	A										
15	A											

TABLE OF SCHEDULES

DN	SCHEDULE
15	160
20	160
25	160
40	160
50	160
80	160
100	160
150	160
200	160
250	160
300	160

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

STAINL STEEL AISI 316	PLANT	:	
CLASS NO. : 253021	CONSIGNEE	:	
ANS RATING : CLASS 2500	ENGINEERED BY	:	
CORR. ALL. : 0 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 12/96	PROJECT NO.	:	

ISSUE DATE : JANUARY 1999			

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESG buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-150	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105
LJFL	LAP-JOINT FLANGE	---	ASTM A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP316
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP316
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-300	ASTM A403-WP316L
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A403-WP316L

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F316
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F316
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-300	ASTM A182-F316
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A403-WP316L

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15- 40	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 50- 50	ASTM A182-F316

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE											
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300

* PIPE													
PIPE		74.36.33	021.1	029.1	038.1	054.1	063.1	071.1	079.1	088.1	100.1	112.1	124.1
PIPE NIPPLE 50MM		76.33.57	981.1	986.1	991.1	996.1							
* FLANGES													
BLIND FLANGE		76.65.10	551.1	552.1	553.1	554.1	555.1	557.1	558.1	560.1			
SPECTACLE BLIND FLANGE		76.88.10	538.1	542.1	546.1	548.1	550.1	552.1	554.1	556.1	558.1	560.1	562.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	648.1	652.1	656.1	658.1	660.1	662.1	664.1	666.1	668.1	670.1	672.1
WELDING NECK FLANGE		76.65.80	622.1	624.1	626.1	628.1	660.1	662.1	664.1	666.1	668.1	670.1	672.1
* FITTINGS													
CAP BUTT-WELD.END		76.33.19	291.1	301.1	311.1	330.1	340.1	360.1	380.1	399.1	413.1	428.1	444.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	291.1	301.1	311.1	330.1	340.1	360.1	380.1	399.1	413.1	429.1	445.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	291.1	301.1	311.1	330.1	340.1	360.1	380.1	399.1	413.1	429.1	445.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	790.1	800.1	810.1	830.1	840.1	860.1	880.1	899.1	913.1	929.1	945.1
* VALVES													
CHECK VALVE FLANGED		77.13.18					258.1	260.1	262.1	264.1	265.1	266.1	267.1
		77.13.82	253.1	254.1	255.1	257.1							
GATE VALVE BUTT-WELD ENDS		77.24.82	253.1	254.1	255.1	257.1							
GATE VALVE FLANGED		77.23.03	253.1	254.1	255.1	257.1	258.1	260.1	262.1	264.1	265.1	266.1	267.1
GLOBE VALVE BUTT-WELD ENDS		77.34.83	253.1	254.1	255.1	257.1							
GLOBE VALVE FLANGED		77.33.03	253.1	254.1	255.1	257.1	258.1	260.1	262.1				
* MISCELLANEOUS													
GASKET, SPIRAL WOUND		85.41.46	554.1	556.1	558.1	562.1	564.1	568.1	570.1	574.1	576.1	578.1	580.1
ORIFICE FLANGE SET		76.65.92					640.1	642.1	644.1	646.1	648.1	650.1	652.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.574.1	33.72.574.1	36.86.005.1
25* 15		33.70.584.1	33.72.584.1	36.86.023.1
25* 20		33.70.594.1	33.72.594.1	36.86.039.1
40* 15		33.70.604.1	33.72.604.1	36.86.055.1
40* 20		33.70.622.1	33.72.622.1	36.86.073.1
40* 25		33.70.632.1	33.72.632.1	36.86.089.1
50* 20		36.50.099.1	36.63.099.1	36.86.105.1
50* 25		33.70.640.1	33.72.640.1	36.86.123.1
50* 40		33.70.650.1	33.72.650.1	36.86.139.1
80* 40		33.70.680.1	33.72.680.1	36.86.155.1
80* 50	79.71.180.1	33.70.690.1	33.72.690.1	36.86.173.1
100* 40		33.70.699.1	33.72.699.1	36.86.189.1
100* 50	79.71.182.1	33.70.710.1	33.72.710.1	36.86.208.1
100* 80	79.71.206.1	33.70.720.1	33.72.720.1	36.86.227.1
150* 50	79.71.184.1			
150* 80	79.71.208.1	33.70.750.1	33.72.750.1	36.86.246.1
150*100	79.71.230.1	33.70.760.1	33.72.760.1	36.86.264.1
200* 50	79.71.186.1			
200* 80	79.71.210.1			
200*100	79.71.232.1	33.70.771.1	33.72.771.1	36.86.284.1
200*150	79.71.252.1	33.70.783.1	33.72.783.1	36.86.308.1
250* 50	79.71.188.1			
250* 80	79.71.212.1			
250*100	79.71.234.1	36.50.256.1	36.63.256.1	36.86.332.1
250*150	79.71.254.1	33.70.800.1	33.72.800.1	36.86.355.1
250*200	79.71.272.1	33.70.813.1	33.72.813.1	36.86.384.1
300* 50	79.71.190.1			
300* 80	79.71.214.1			
300*100	79.71.236.1			
300*150	79.71.256.1	33.70.822.1	33.72.822.1	36.86.417.1
300*200	79.71.274.1	33.70.834.1	33.72.834.1	36.86.445.1
300*250	79.71.290.1	33.70.846.1	33.72.846.1	36.86.479.1

		BNIF	BNIP
		76.80.39	76.80.31
BRANCH	RUN-PIPE		
15	40-300	181.1	650.1
20	40-300	183.1	652.1
25	40-100	185.1	654.1
	150-300	186.1	656.1
40	50-100	190.1	658.1
	150-300	191.1	660.1
50	80-100	196.1	
	150-250	197.1	
	300-300	198.1	

THERMOWELL	
LENGTH	MESCNUMBER
230	76.83.38.001.1
255	76.83.38.002.1
305	76.83.38.003.1
355	76.83.38.005.1
405	76.83.38.006.1
455	76.83.38.007.1

COMP.	
NAME	DESCRIPTION
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET ORIFICE FLANGES

ASSEMBLIES

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ISSUE DATE : JANUARY 1999

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 130	61.334.1					
20	4	3/4	* 130	61.334.1					
25	4	7/8	* 140	61.404.1					
40	4	1 1/8	* 170	61.532.1					
50	8	1	* 180	61.475.1	50	8	1	* 190	61.477.1
80	8	1 1/4	* 220	61.597.1	80	8	1 1/4	* 230	61.598.1
100	8	1 1/2	* 300	61.696.1	100	8	1 1/2	* 320	61.700.1
150	8	2	* 410	61.825.1	150	8	2	* 420	61.827.1
200	12	2	* 450	61.831.1	200	12	2	* 460	61.834.1
250	12	2 1/2	* 570	83.708.1	250	12	2 1/2	* 570	83.708.1
300	12	2 3/4	* 630	83.784.1	300	12	2 3/4	* 640	83.785.1

BOLTSET SPECTACLE/SPACER

81.38				
DN	NR	INCH	* MM	
15	4	3/4	* 140	61.335.1
20	4	3/4	* 140	61.335.1
25	4	7/8	* 160	61.407.1
40	4	1 1/8	* 190	61.535.1
50	8	1	* 210	61.480.1
80	8	1 1/4	* 260	61.603.1
100	8	1 1/2	* 350	61.704.1
150	8	2	* 460	61.834.1
200	12	2	* 510	83.562.1
250	12	2 1/2	* 640	83.715.1
300	12	2 3/4	* 720	83.793.1

* DRAIN POINT	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.551.1	
GASKET, SPIRAL WOUND	1	85.41.46.554.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.82.253.1	
PIPE NIPPLE 50MM	1	76.33.57.981.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.65.80.622.1	

* DRAIN POINT	DN 20	FIG.0N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.552.1	
GASKET, SPIRAL WOUND	1	85.41.46.556.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.82.254.1	
PIPE NIPPLE 50MM	1	76.33.57.986.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.65.80.624.1	

* DRAIN POINT	DN 20	FIG.0M	DN 50 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.552.1	
GASKET, SPIRAL WOUND	1	85.41.46.556.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.82.254.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.65.80.624.1	

* ORIFICE INSTR.CONN.	DN 15	FIG.0M	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.554.1	
GATE VALVE BUTT-WELD ENDS	2	77.24.82.253.1	
LAP-JOINT FLANGE	2	76.62.20.558.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	2	76.65.80.622.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.554.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.82.253.1	
LAP-JOINT FLANGE	1	76.62.20.558.1	
PIPE NIPPLE 50MM	1	76.33.57.981.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.65.80.622.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.0M	DN 40 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.554.1	
GATE VALVE BUTT-WELD ENDS	1	77.24.82.253.1	
LAP-JOINT FLANGE	1	76.62.20.558.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.65.80.622.1	

* TEMPERATURE INSTR.C.	DN 50	FIG.BB	DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.549.1	
GASKET, SPIRAL WOUND	1	85.41.46.564.1	
STUD BOLT WITH NUTS	8	81.38.61.480.1	
THERMOWELL TAPERED	L=255 MM	1	76.83.38.002.1

* TEMPERATURE INSTR.C.	DN 50	FIG.CC	DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
COVER FLANGE THERMOWELL NOZZLE	1	76.62.60.549.1	
GASKET, SPIRAL WOUND	1	85.41.46.564.1	
STUD BOLT WITH NUTS	8	81.38.61.480.1	
THERMOWELL TAPERED	L=305 MM	1	76.83.38.003.1

* VENT POINT	DN 15	FIG.1N	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.551.1	
GASKET, SPIRAL WOUND	1	85.41.46.554.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.83.253.1	
PIPE NIPPLE 50MM	1	76.33.57.981.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.65.80.622.1	

* VENT POINT	DN 20	FIG.1N	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.552.1	
GASKET, SPIRAL WOUND	1	85.41.46.556.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.83.254.1	
PIPE NIPPLE 50MM	1	76.33.57.986.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.65.80.624.1	

* VENT POINT	DN 20	FIG.1M	DN 50 -300
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.552.1	
GASKET, SPIRAL WOUND	1	85.41.46.556.1	
GLOBE VALVE BUTT-WELD ENDS	1	77.34.83.254.1	
STUD BOLT WITH NUTS	4	81.38.61.334.1	
WELDING NECK FLANGE	1	76.65.80.624.1	

CLASS 253055

DESIGN LIMITS

		TEMPERATURE IN DEGREES CELSIUS									
		0	150	200	250	300	350	400	450	500	538
		PRESSURE BAR GA									
DN15 -50		328.9	316.5	315.1	298.9	284.2	272.7	263.2	256.9	233.4	204.5
DN80 -600		236.6	236.6	236.6	229.5	218.9	209.9	202.4	198.5	193.6	190.7

- NOTES
- -----
 - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.4 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.
 - FOR TEMPERATURE POINTS A BRANCH OUTLET (DN 50) SHALL BE USED FOR NOMINAL PIPE SIZES DN 80 AND ABOVE.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

BRANCH CONNECTIONS 90 DEGREES

TABLE OF SCHEDULES

RUN SIZE	BRANCH SIZE															DN	SCHEDULE
	15	20	25	40	50	80	100	150	200	250	300	350	400	450	600		
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	15 160
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20 160
450	C	C	C	C	E	E	E	E	E	E	B	B	B	B	A		25 160
400	C	C	C	C	E	E	E	E	E	B	B	B	B	A			40 160
350	C	C	C	C	E	E	E	E	E	B	B	B	A				50 160
300	C	C	C	C	E	E	E	E	B	B	B	A					80 160
250	C	C	C	C	E	E	E	B	B	A							100 160
200	C	C	C	C	E	E	B	B	A								150 160
150	C	C	C	C	E	B	B	A									200 24.0
100	C	C	C	C	B	B	A										250 30.0
80	C	C	C	B	B	A											300 36.0
50	C	C	B	A													350 40.0
40	C	B	B	A													400 44.0
25	B	B	A														450 50.0
20	B	A															500 56.0
15	A																600 66.0

CODE	EXPLANATION OF CHARACTERS
-----	-----
A	EQUAL TEE
B	REDUCING TEE
C	BRANCH FITTING
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINL STEEL AISI 321 STAB HT	PLANT :	
CLASS NO. : 253055	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : JANUARY 1999

COMPONENT/MATERIAL DESCRIPTIONS
(For full material description see relevant MESC buying description.)

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ISSUE DATE : JANUARY 1999

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP321 STAB HT
		DN350-600	ASTM A358-321 STAB HT
PNPP	PIPE NIPPLE 50MM	DN 15- 40	ASTM A312-TP321 STAB HT

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F321 STAB HT
LJFL	LAP-JOINT FLANGE	---	ASTM A182-F321/347
SBFL	SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240-TP321 STAB HT
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240-TP321 STAB HT
WNFL	WELDING NECK FLANGE	DN 15-300	ASTM A182-F321 STAB HT

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A403-WP-S-321 STAB HT
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-600	ASTM A403-WP-S-321 STAB HT
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F321 STAB HT
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F321 STAB HT
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-600	ASTM A182-F321 STAB HT
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A403-WP-S-321 STAB HT
		DN 50-600	ASTM A403-WP-S/W-321 STAB HT
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A403-WP-S-321 STAB HT
		DN450-600	ASTM A403-WP-S/W-321 STAB HT

* VALVES

CHVB	CHECK VALVE BUTT-WELD ENDS	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GAVB	GATE VALVE BUTT-WELD ENDS	DN 15-300	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6
GLVB	GLOBE VALVE BUTT-WELD ENDS	DN 15-100	BODY: ASTM A351-CF8C,A182-F321 TRIM: AISI 321,STELLITE 6

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
STBT	STUD BOLT WITH NUTS	---	ASTM A453-GR.660 CLASS A
TWWG	THERMOWELL WELDED HIGH PRESS.	DN 50- 50	ASTM A182-F321 STAB HT

PIPING COMPONENTS

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ISSUE DATE : JANUARY 1999

		NOMINAL PIPE SIZE																
ITEM DESCRIPTION		MESC	15	20	25	40	50	80	100	150	200	250	300	350	400	450	500	600

* PIPE																		
PIPE		74.36.19	021.1	029.1	038.1	053.1	061.1	069.1	078.1	087.1								
		74.36.20									140.1	180.1	232.1	292.1	352.1	424.1	504.1	584.1
PIPE NIPPLE 50MM		76.33.57	091.1	101.1	111.1	121.1												
* FLANGES																		
BLIND FLANGE		76.65.08	302.1	304.1	306.1	308.1	310.1	312.1	314.1	316.1	318.1	320.1	322.1					
SPECTACLE BLIND FLANGE		76.88.10	878.1	882.1	886.1	888.1	890.1	892.1	894.1	896.1	898.1	900.1	902.1					
SPACER RING TYPE (ASME FLANGE)		76.88.15	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	138.1	140.1	142.1					
WELDING NECK FLANGE		76.65.77	312.1	314.1	316.1	318.1	320.1	322.1	324.1	326.1	342.1	344.1	346.1					
* FITTINGS																		
CAP BUTT-WELD.END		76.33.21	041.1	051.1	061.1	080.1	092.1	112.1	132.1	150.1								
		76.33.22									140.1	180.1	232.1	292.1	352.1	424.1	504.1	584.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.36									140.1	180.1	232.1	292.1	352.1	424.1	504.1	584.1
		76.33.37	541.1	551.1	561.1	580.1	590.1	610.1	630.1	649.1								
ELBOW 90 DEG BUTT-WELD ENDS		76.33.39	791.1	801.1	811.1	830.1	840.1	860.1	880.1	899.1								
		76.33.43									140.1	180.1	232.1	292.1	352.1	424.1	504.1	584.1
EQUAL TEE BUTT-WELD ENDS		76.33.83	791.1	801.1	811.1	830.1	842.1	862.1	882.1	900.1								
		76.33.90									140.1	180.1	232.1	292.1	352.1	424.1	504.1	584.1
* VALVES																		
CHECK VALVE BUTT-WELD ENDS		77.14.87	253.1	254.1	255.1	257.1	258.1	260.1	262.1	264.1	285.1	286.1	287.1					
GATE VALVE BUTT-WELD ENDS		77.24.87	253.1	254.1	255.1	257.1	258.1	260.1	262.1	264.1	285.1	286.1	287.1					
GLOBE VALVE BUTT-WELD ENDS		77.34.87	253.1	254.1	255.1	257.1	258.1	260.1	262.1									
* MISCELLANEOUS																		
GASKET, SPIRAL WOUND		85.41.46	554.1	556.1	558.1	562.1	564.1	568.1	570.1	574.1	576.1	578.1	580.1					

BROB		RECB		REEB		TERB		BROB		RECB		REEB		TERB		BNIF		BNIP	
76.		76.		76.		76.		76.		76.		76.		76.		76.80.40		76.80.30	
RUN*	BR													BRANCH	RUN-PIPE				
20*	15		33.68.569.1	33.74.069.1	33.88.022.1	400*	50	79.95.100.1								15	40-150	741.1	121.1
25*	15		33.68.580.1	33.74.080.1	33.88.034.1	400*	80	79.95.240.1									200-600	742.1	122.1
25*	20		33.68.590.1	33.74.090.1	33.88.041.1	400*	100	79.95.369.1								20	40- 80	743.1	123.1
40*	15		33.68.600.1	33.74.100.1	33.88.045.1	400*	150	79.95.481.1	33.60.770.1	33.80.770.1							100-600	744.1	124.1
40*	20		33.68.620.1	33.74.120.1	33.88.051.1	400*	200		33.60.804.1	33.80.804.1	33.97.804.1					25	40- 40	745.1	125.1
40*	25		33.68.629.1	33.74.129.1	33.88.061.1	400*	250		33.60.853.1	33.80.853.1	33.97.853.1						50- 50	746.1	126.1
50*	20		36.49.105.1	36.64.405.1		400*	300		33.60.904.1	33.80.904.1	33.97.904.1						80-100	747.1	127.1
50*	25		33.68.639.1	33.74.139.1		400*	350		33.60.954.1	33.80.954.1	33.97.954.1						150-600	748.1	128.1
50*	40		33.68.649.1	33.74.149.1	33.88.085.1	450*	50	79.95.115.1								40	50- 50	750.1	129.1
80*	40		33.68.680.1	33.74.180.1	33.88.098.1	450*	80	79.95.255.1									80- 80	751.1	130.1
80*	50	79.59.180.1	33.68.690.1	33.74.190.1	33.88.108.1	450*	100	79.95.385.1									100-100	752.1	131.1
100*	40		36.49.189.1	36.64.189.1		450*	150	79.95.497.1									150-300	753.1	132.1
100*	50	79.59.182.1	33.68.710.1	33.74.210.1	33.88.204.1	450*	200	79.95.596.1	33.61.030.1	33.81.030.1							350-600	754.1	133.1
100*	80	79.59.206.1	33.68.720.1	33.74.220.1	33.88.232.1	450*	250		33.61.062.1	33.81.062.1	33.98.062.1					50	80- 80	756.1	
150*	50	79.59.184.1				450*	300		33.61.112.1	33.81.112.1	33.98.112.1						100-100	757.1	
150*	80	79.59.208.1	33.68.750.1	33.74.250.1	33.88.260.1	450*	350		33.61.163.1	33.81.163.1	33.98.163.1						150-250	758.1	
150*	100	79.59.230.1	33.68.760.1	33.74.260.1	33.88.288.1	450*	400		33.61.213.1	33.81.213.1	33.98.213.1						300-400	759.1	
200*	50	79.95.043.1				500*	50	79.95.129.1									450-600	760.1	
200*	80	79.95.195.1				500*	80	79.95.269.1											
200*	100		33.60.161.1	33.80.161.1	33.97.161.1	500*	100	79.95.399.1											
200*	150		33.60.196.1	33.80.196.1	33.97.196.1	500*	150	79.95.511.1											
250*	50	79.95.057.1				500*	200	79.95.610.1	33.61.300.1	33.81.300.1									
250*	80	79.95.197.1				500*	250		33.61.320.1	33.81.320.1	33.98.312.1								
250*	100	79.95.323.1	33.60.230.1	33.80.230.1	33.97.231.1	500*	300		33.61.362.1	33.81.362.1	33.98.362.1								
250*	150		33.60.277.1	33.80.277.1	33.97.277.1	500*	350		33.61.413.1	33.81.413.1	33.98.413.1								
250*	200		33.60.326.1	33.80.326.1	33.97.326.1	500*	400		33.61.463.1	33.81.463.1	33.98.463.1								
300*	50	79.95.072.1				500*	450		33.61.514.1	33.81.514.1	33.98.514.1								
300*	80	79.95.212.1				600*	50	79.95.143.1											
300*	100	79.95.341.1				600*	80	79.95.283.1											
300*	150		33.60.379.1	33.80.379.1	33.97.379.1	600*	100	79.95.413.1										115	76.83.43.021.1
300*	200		33.60.440.1	33.80.440.1	33.97.440.1	600*	150	79.95.525.1										135	76.83.43.022.1
300*	250		33.60.503.1	33.80.503.1	33.97.503.1	600*	200	79.95.624.1										165	76.83.43.023.1
350*	50	79.95.086.1				600*	250	79.95.708.1	33.61.550.1	33.81.550.1									
350*	80	79.95.226.1				600*	300		33.61.600.1	33.81.600.1	33.98.612.1								
350*	100	79.95.355.1				600*	350		33.61.670.1	33.81.670.1	33.98.663.1								
350*	150	79.95.467.1	33.60.580.1	33.80.580.1		600*	400		33.61.714.1	33.81.714.1	33.98.714.1								
350*	200		33.60.617.1	33.80.617.1	33.97.617.1	600*	450		33.61.764.1	33.81.764.1	33.98.764.1								
350*	250		33.60.664.1	33.80.664.1	33.97.664.1	600*	500		33.61.814.1	33.81.814.1	33.98.814.1								
350*	300		33.60.710.1	33.80.710.1	33.97.710.1														

COMP.	
NAME	DESCRIPTION
-----	-----
BNIF	BRANCH FITTING FLANGED OUTLET
BNIP	BRANCH FITTING PLAIN-END OUTL.
BROB	BRANCH OUTLET RED. BUTT WELD
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

THERMOWELL	
LENGTH	MESCNUMBER
-----	-----
115	76.83.43.021.1
135	76.83.43.022.1
165	76.83.43.023.1

BOLTING
BOLTSET FLANGED JOINTS

BOLTSET SPECTACLE/SPACER

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	3/4	* 130	15	4	3/4	* 140
20	4	3/4	* 130	20	4	3/4	* 140
25	4	7/8	* 140	25	4	7/8	* 160
40	4	1 1/8	* 170	40	4	1 1/8	* 190
50	8	1	* 180	50	8	1	* 210
80	8	1 1/4	* 220	80	8	1 1/4	* 260
100	8	1 1/2	* 300	100	8	1 1/2	* 350
150	8	2	* 410	150	8	2	* 460
200	12	2	* 450	200	12	2	* 510
250	12	2 1/2	* 570	250	12	2 1/2	* 640
300	12	2 3/4	* 630	300	12	2 3/4	* 720

ASSEMBLIES

* DRAIN POINT DN 15 FIG.0N DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.302.1
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BUTT-WELD ENDS 1 77.24.87.253.1
PIPE NIPPLE 50MM 1 76.33.57.091.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
WELDING NECK FLANGE 1 76.65.77.312.1

* DRAIN POINT DN 20 FIG.0N DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.304.1
GASKET, SPIRAL WOUND 1 85.41.46.556.1
GATE VALVE BUTT-WELD ENDS 1 77.24.87.254.1
PIPE NIPPLE 50MM 1 76.33.57.101.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
WELDING NECK FLANGE 1 76.65.77.314.1

* DRAIN POINT DN 20 FIG.0M DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.304.1
GASKET, SPIRAL WOUND 1 85.41.46.556.1
GATE VALVE BUTT-WELD ENDS 1 77.24.87.254.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
WELDING NECK FLANGE 1 76.65.77.314.1

* PRESSURE INSTR.CONN. DN 15 FIG.0N DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BUTT-WELD ENDS 1 77.24.87.253.1
LAP-JOINT FLANGE 1 76.65.20.658.1
PIPE NIPPLE 50MM 1 76.33.57.091.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
WELDING NECK FLANGE 1 76.65.77.312.1

* PRESSURE INSTR.CONN. DN 15 FIG.0M DN 40 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GATE VALVE BUTT-WELD ENDS 1 77.24.87.253.1
LAP-JOINT FLANGE 1 76.65.20.658.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
WELDING NECK FLANGE 1 76.65.77.312.1

* TEMPERATURE INSTR.C. DN 50 FIG.WA DN 80 - 80
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
THERMOWELL WELDED L=115 MM 1 76.83.43.021.1

* TEMPERATURE INSTR.C. DN 50 FIG.WB DN100 -100
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
THERMOWELL WELDED L=135 MM 1 76.83.43.022.1

* TEMPERATURE INSTR.C. DN 50 FIG.WC DN150 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
THERMOWELL WELDED L=165 MM 1 76.83.43.023.1

* VENT POINT DN 15 FIG.1N DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.302.1
GASKET, SPIRAL WOUND 1 85.41.46.554.1
GLOBE VALVE BUTT-WELD ENDS 1 77.34.87.253.1
PIPE NIPPLE 50MM 1 76.33.57.091.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
WELDING NECK FLANGE 1 76.65.77.312.1

* VENT POINT DN 20 FIG.1N DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.304.1
GASKET, SPIRAL WOUND 1 85.41.46.556.1
GLOBE VALVE BUTT-WELD ENDS 1 77.34.87.254.1
PIPE NIPPLE 50MM 1 76.33.57.101.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
WELDING NECK FLANGE 1 76.65.77.314.1

* VENT POINT DN 20 FIG.1M DN 50 -600
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.65.08.304.1
GASKET, SPIRAL WOUND 1 85.41.46.556.1
GLOBE VALVE BUTT-WELD ENDS 1 77.34.87.254.1
STUD BOLT WITH NUTS 4 81.38.74.334.1
WELDING NECK FLANGE 1 76.65.77.314.1