



MANUAL

SIEP PIPING CLASSES

DEP 31.38.01.15-Gen.

December 1998

DESIGN AND ENGINEERING PRACTICE



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They are based on the experience acquired during their involvement with the design, construction, operation and maintenance of processing units and facilities, and they are supplemented with the experience of Group Operating companies. Where appropriate they are based on, or reference is made to, national and international standards and codes of practice.

The objective is to set the recommended standard for good design and engineering practice applied by Group companies operating an oil refinery, gas handling installation, chemical plant, oil and gas production facility, or any other such facility, and thereby to achieve maximum technical and economic benefit from standardization.

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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- 3) Contractors/subcontractors and Manufacturers/Suppliers under a contract with users referred to under 1) or 2) which requires that tenders for projects, materials supplied or - generally - work performed on behalf of the said users comply with the relevant standards.

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Without prejudice to any specific terms in respect of confidentiality under relevant contractual arrangements, DEPs shall not, without the prior written consent of SIOP and SIEP, be disclosed by users to any company or person whomsoever and the DEPs shall be used exclusively for the purpose for which they have been provided to the user. They shall be returned after use, including any copies which shall only be made by users with the express prior written consent of SIOP and SIEP. The copyright of DEPs vests in SIOP and SIEP. Users shall arrange for DEPs to be held in safe custody and SIOP or SIEP may at any time require information satisfactory to them in order to ascertain how users implement this requirement.

All administrative queries should be directed to the DEP Administrator in SIOP.

NOTE: In addition to DEP publications there are Standard Specifications and Draft DEPs for Development (DDD's). DDD's 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 DDD's. Standard Specifications and DDD's will gradually be replaced by DEPs.

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1. INTRODUCTION

1.1 SCOPE

This DEP contains the SIEP standard piping classes which have been developed for exploration and production facilities. 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 July 1997. A summary of the changes since the last revision is included in (1.6).

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

Excluded from the scope of this DEP are oil and gas transmission pipeline systems.

Also excluded from the scope of this DEP are piping classes developed for oil refineries, chemical plants, gas plants and supply/marketing installations, which are included in DEP 31.38.01.12-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 exploration and production facilities, within the property limits as defined in ASME B31.3 par. 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

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.

1.4 CROSS REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section number is shown in brackets. Other documents referenced by this DEP are listed in (1.5).

1.5 REFERENCES

In this DEP, reference is made to the following publications:

- NOTES:
1. Unless specifically designated by date, the latest edition of each publication shall be used, together with any amendments/supplements/revisions thereto.
 2. Excluded from this list are the standards referenced in the piping classes themselves, a list of which would be too extensive.

SHELL STANDARDS:

Index to DEPs and standard specifications	DEP 00.00.05.05-Gen.
Piping classes - Basis of Design	DEP 31.38.01.10-Gen.
Piping - General requirements	DEP 31.38.01.11-Gen.
SIOP piping classes	DEP 31.38.01.12-Gen.

AMERICAN STANDARDS:

Process Piping	ASME B31.3 (1997)

1.6 SUMMARY OF CHANGES SINCE THE LAST REVISION

Piping class	Rev. Letter	Rev. Date	Revision notes (see end of Table)
11410	B	1298	a3
11420	B	1298	a3
11430	B	1298	a3
11440	B	1298	a3
11441	A	1298	a3
11470	B	1298	a3
11480	B	1298	a3
11490	B	1298	a3
11500	B	1298	a3
11501	A	1298	a3
13410	B	1298	g1, a3
13420	A	1298	g1, a3, b1
13430	B	1298	g1
13450	B	1298	g1, a3
13460	B	1298	g1, a3, b1
13831	A	1298	a1, a3, c1, f1
13832	A	1298	a3, c1, f1
13833	A	1298	a2, a3, b1, c1, f1
13834	A	1298	a3, b1, c1, f1
18410	B	1298	c2
18420	B	1298	c2
31410	B	1298	a3, d1
31420	B	1298	a3
31430	B	1298	a3, d1
31440	B	1298	a3
31441	A	1298	a3
31450	B	1298	d1
31470	B	1298	a3
31480	B	1298	a3
31490	B	1298	a3
31500	B	1298	a3, b2
31501	A	1298	a3, b2
33410	B	1298	a3
33420	A	1298	a3, b1
33450	B	1298	a3, b1, b2
33460	B	1298	a3, b1
33831	A	1298	g1, a1, a3, c1, f1
33832	A	1298	g1, a3, c1, f1
33833	A	1298	g1, a2, a3, b1, c1, f1
33834	A	1298	g1, a3, b1, c1, f1
61410	B	1298	e1
61420	B	1298	e1
61430	B	1298	e1
61440	B	1298	e1
61441	A	1298	e1
61450	B	1298	e1
61460	B	1298	e1
61470	B	1298	e1
61480	B	1298	b2, e1
61490	B	1298	b2, e1
61500	B	1298	b2, e1
61501	A	1298	b2, e1
63410	B	1298	b2, e1
63420	A	1298	b1, e1, f1
63430	B	1298	g1, e1, f1
63450	B	1298	b1, e1, f1

SUMMARY OF CHANGES SINCE THE LAST REVISION (continued)

Piping class	Rev. Letter	Rev. Date	Revision notes (see end of Table)
63460	B	1298	b1, e1, f1
63831	A	1298	g1, a1, c1, e1, f1
63832	A	1298	g1, c1, e1, f1
63833	A	1298	g1, a2, b1, c1, e1, f1
63834	A	1298	g1, b1, c1, e1, f1
91410	B	1298	e1
91420	B	1298	e1
91430	B	1298	e1
91440	B	1298	e1
91441	A	1298	e1
91450	B	1298	e1
91460	B	1298	e1
91470	B	1298	e1
91480	B	1298	e1
91490	B	1298	e1
91500	B	1298	e1
91501	A	1298	e1
91520	B	1298	e1
91521	A	1298	e1
93410	B	1298	e1
93420	A	1298	e1
93430	B	1298	e1
93450	B	1298	e1
93460	B	1298	e1
93831	A	1298	a1, c1, e1, f1
93832	A	1298	c1, e1, f1
93833	A	1298	g1, a2, c1, e1, f1
93834	A	1298	c1, e1, f1
153831	A	1298	g1, a1, c1, f1
153832	A	1298	c1, f1
153833	A	1298	g1, a2, c1, f1
153834	A	1298	c1, f1
253831	A	1298	g1, a1, c1
253832	A	1298	c1
253833	A	1298	g1, a2, c1
253834	A	1298	c1

Revision Notes:

General	g1	P/T rating changed - revision ASME B16.5 1996
Bolting	a1	Material changed to ASTM A193-B7/A194-2H
	a2	Material changed to ASTM A193-L7/A194-4
	a3	Boltset butterfly valves changed
Levelgauge	b1	Bolting changed
	b2	Reflex type added
Material	c1	Standardised on sour service (except bolting)
	c2	Description page 2 updated
Pipe	d1	Size DN 400 changed to seamless
Thermowell	e1	Type changed
Fitting	f1	Reducing fittings added

2. SUMMARY OF ISSUED PIPING CLASSES

Material	Piping class no.	ASME class rating					
		150	300	600	900	1500	2500
Carbon steel	1410	x	x	x	x	x	x
	1420	x	x	x	x	x	x
	1430	x	x	x	x	x	x
	1440	x	x	x	x	x	x
	1441	x	x	x	x	x	x
	1450	x	x	x	x	x	
	1460	x	x	x	x	x	
	1470	x	x	x	x	x	
	1480	x	x	x	x	x	
	1490	x	x	x	x	x	
	1500	x	x	x	x	x	
	1501	x	x	x	x	x	
	1520				x	x	x
	1521				x	x	x
Stainless steel	3410	x	x	x	x	x	
	3420	x	x	x	x	x	
	3430	x	x	x	x	x	
	3450	x	x	x	x	x	
	3460	x	x	x	x	x	
Duplex stainless steel	3831	x	x	x	x	x	x
	3832	x	x	x	x	x	x
	3833	x	x	x	x	x	x
	3834	x	x	x	x	x	x
Nickel and nickel base alloys	6410	x					
Carbon steel galvanised	8410	x					
	8420	x					

3. PIPING CLASS SELECTION GUIDE

References to piping classes shall be considered as preliminary selections. For final selection of materials, and for services not specifically defined below, a materials/corrosion engineer shall be consulted

Service		Piping class	Pipe material	Temperature range		C.A mm.	Remarks
Medium	Properties			Min.	Max.		
Air	Maint./plant/instrument	1410	CS	0	120	1	
Antifoam/coagulant		3410	316L	-20	120	0	60 °C max. if chlorides present
Chemicals	General	3410	316L	-20	120	0	60 °C max. if chlorides present
Chemicals	Low temp	1470	CS	-50	120	1	
De-emulsifier		3410	316L	-20	120	0	60 °C max. if chlorides present
Diesel oil		1410	CS	0	120	1	
Fire fighting foam		3410	316L	-20	120	0	60 °C max. if chlorides present
Fuel gas	Sour	1460	CS	0	200	1	Only upstream of filter
Fuel gas		3430	316L	-20	120	0	60 °C max. if chlorides present
Fuel gas		1450	CS	0	200	1	Only upstream of filter
Glycol	Corrosive	1430	CS	0	120	3	
Glycol	Sour	1420	CS	0	120	1	0.1 bar max. partial pressure H ₂ S
Glycol	Sour	1460	CS	0	200	1	0.1 bar max. partial pressure H ₂ S
Glycol	Sour, corrosive	1440	CS	0	120	3	0.1 bar max. partial pressure H ₂ S
Glycol		1410	CS	0	120	1	
Glycol		3410	316L	-20	120	0	60 °C max. if chlorides present
Glycol		1450	CS	0	200	1	
Hydraulic oil		3410	316L	-20	120	0	60 °C max. if chlorides present
Hydrocarbons	Corrosive	1430	CS	0	120	3	
Hydrocarbons	Corrosive	1490	CS	-50	120	3	
Hydrocarbons	Corrosive	3831	Duplex	-20	120	0	
Hydrocarbons	Corrosive	3833	Duplex	-50	120	0	
Hydrocarbons	High sour, corrosive	1441	CS	0	120	3	5.0 bar max. partial pressure H ₂ S
Hydrocarbons	High sour, corrosive	1501	CS	-50	120	3	5.0 bar max. partial pressure H ₂ S
Hydrocarbons	Sour	1420	CS	0	120	1	0.1 bar max. partial pressure H ₂ S
Hydrocarbons	Sour	1480	CS	-50	120	1	0.1 bar max. partial pressure H ₂ S
Hydrocarbons	Sour	3460	316L	-73	120	0	0.03 bar max. partial pressure H ₂ S
Hydrocarbons	Sour	1460	CS	0	200	1	0.1 bar max. partial pressure H ₂ S
Hydrocarbons	Sour, corrosive	1440	CS	0	120	3	0.1 bar max. partial pressure H ₂ S
Hydrocarbons	Sour, corrosive	1500	CS	-50	120	3	0.1 bar max. partial pressure H ₂ S
Hydrocarbons	Sour, corrosive	1520	CS	0	120	3	Flow lines, 0.1 bar max. partial pressure H ₂ S
Hydrocarbons	Sour, corrosive	3832	Duplex	-20	120	0	0.02 bar max. partial pressure H ₂ S
Hydrocarbons	Sour, corrosive	3834	Duplex	-50	120	0	0.02 bar max. partial pressure H ₂ S
Hydrocarbons		1410	CS	0	120	1	
Hydrocarbons		1470	CS	-50	120	1	
Hydrocarbons		3450	316L	-100	120	0	60 °C max. if chlorides present
Hydrocarbons		1450	CS	0	200	1	
Inject. water-treated	0.1 mg/kg max. O ₂	1410	CS	0	120	1	
Inject. water-treated	0.1 mg/kg max. O ₂ sour	1420	CS	0	120	1	0.1 bar max. partial pressure H ₂ S
Jet fuel		3410	316L	-20	120	0	60 °C max. if chlorides present
Luboil		1410	CS	0	120	1	Only upstream of filter
Luboil		3410	316L	-20	120	0	60 °C max. if chlorides present
Methanol		1410	CS	0	120	1	Verify Viton seals grade
Mud	Circulation	1410	CS	0	120	1	
Mud	Corrosive	1430	CS	0	120	3	
Mud	Dry / oil-based	1410	CS	0	120	1	
Mud	Sour	1420	CS	0	120	1	0.1 bar max. partial pressure H ₂ S
Mud	Sour, corrosive	1440	CS	0	120	3	0.1 bar max. partial pressure H ₂ S
Oxygen scavenger		3410	316L	-20	120	0	60 °C max. if chlorides present
Seal oil	Corrosive	1430	CS	0	120	3	Only upstream of filter
Seal oil	Sour	1420	CS	0	120	1	Only upstream of filter
Seal oil	Sour	3460	316L	-73	120	0	0.03 bar max. partial pressure H ₂ S
Seal oil	Sour, corrosive	1440	CS	0	120	3	Only upstream of filter
Seal oil		1410	CS	0	120	1	Only upstream of filter
Seal oil		3410	316L	-20	120	0	60 °C max. if chlorides present

PIPING CLASS SELECTION GUIDE (continued)

References to piping classes shall be considered as preliminary selections. For final selection of materials, and for services not specifically defined below, a materials/corrosion engineer shall be consulted

Service		Piping class	Pipe material	Temperature range		C.A mm.	Remarks
Medium	Properties			Min.	Max.		
Sodium hypochlorite		6410	Titanium	0	50	0	No dry chloride
Waste sewage		8420	CS (galv.)	0	60	0	
Waste treatment		8420	CS (galv.)	0	60	0	
Water, fresh cooling	Treated, 0.1 mg/kg max. O ₂	1410	CS	0	120	1	0.1 bar max. partial pressure H ₂ S
Water, fresh heating	Treated, 0.1 mg/kg max. O ₂	1450	CS	0	200	1	
Water, produced	0.1 mg/kg max. O ₂	1410	CS	0	120	1	
Water, produced	0.1 mg/kg max. O ₂ , sour	1420	CS	0	120	1	
Water, washdown	Brackish/sea water	8410	CS (galv.)	0	60	0	
Wax inhibitor		3410	316L	-20	120	0	

4. INDEX OF PIPING CLASSES

4.1 MATERIALS SELECTION

Material							CA	Diameter		Sour	Low	Design		Piping	
Group	Pipe	Valve Trim			Valve Internal			min	max			Temp. °C	Class		
		Gate, Globe, Check	Butterfly	Check, wafer lug	Ball valve (BS)	Ball valve (API)									
1	CS	ASTM A106-B/API 5L-B	AISI 410 *)	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	CS+ENP, AISI 316 (L)	1	15	600			0	120	11410
2	CS	ASTM A106-B/API 5L-B	AISI 410 *)	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	600			0	120	31410
3	CS	ASTM A106-B/API 5L-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	600			0	120	61410
4	CS	ASTM A106-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	600			0	120	91410
5	CS	ASTM A106-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	600			0	120	151410
6	CS	ASTM A106-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	300			0	120	251410
7	CS	ASTM A106-B	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	CS+ENP, AISI 316 (L)	1	15	600	Sour		0	120	11420
8	CS	ASTM A106-B	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	600	Sour		0	120	31420
9	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	600	Sour		0	120	61420
10	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	600	Sour		0	120	91420
11	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	600	Sour		0	120	151420
12	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS+ENP, AISI 316 (L)	1	15	300	Sour		0	120	251420
13	CS	ASTM A106-B/API 5L-B	AISI 410 *)		AISI 316(L), Stellite 6			1	15	600			0	200	11450
14	CS	ASTM A106-B/API 5L-B	AISI 410 *)		AISI 316(L), Stellite 6			1	15	600			0	200	31450
15	CS	ASTM A106-B/API 5L-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6			1	15	600			0	200	61450
16	CS	ASTM A106-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6			1	15	600			0	200	91450
17	CS	ASTM A106-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6			1	15	600			0	200	151450
18	CS	ASTM A106-B	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6			1	15	600	Sour		0	200	11460
19	CS	ASTM A106-B	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6			1	15	600	Sour		0	200	31460
20	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6			1	15	600	Sour		0	200	61460
21	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6			1	15	600	Sour		0	200	91460
22	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6			1	15	600	Sour		0	200	151460
23	CS	ASTM A106-B/API 5L-B	AISI 410 *)	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	AISI 316(L), PTFE	3	15	600			0	120	11430
24	CS	ASTM A106-B/API 5L-B	AISI 410 *)	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	600			0	120	31430
25	CS	ASTM A106-B/API 5L-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	600			0	120	61430
26	CS	ASTM A106-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	600			0	120	91430
27	CS	ASTM A106-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	600			0	120	151430
28	CS	ASTM A106-B/A333-6	AISI 410 *)		AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	300			0	120	251430
29	CS	ASTM A106-B	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	AISI 316(L), PTFE	3	15	600	Sour		0	120	11440
30	CS	ASTM A106-B	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	600	Sour		0	120	31440
31	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	600	Sour		0	120	61440
32	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS, AISI 316, Nylon	3	15	600	Sour		0	120	91440
33	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS, AISI 316, Nylon	3	15	600	Sour		0	120	151440
34	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS, AISI 316, Nylon	3	15	300	Sour		0	120	251440
35	CS	ASTM A106-B	Incoloy 825, Stellite 6	Incoloy 825, Stellite 6	Incoloy 825	Incoloy 825, PTFE	Incoloy 825, PTFE	3	15	600	Sour		0	120	11441
36	CS	ASTM A106-B	Incoloy 825, Stellite 6	Incoloy 825, Stellite 6	Incoloy 825		Incoloy 825, PTFE	3	15	600	Sour		0	120	31441
37	CS	ASTM A106-B/A333-6	Incoloy 825, Stellite 6		Incoloy 825		Incoloy 825, Nylon	3	15	600	Sour		0	120	61441
38	CS	ASTM A106-B/A333-6	Incoloy 825, Stellite 6		Incoloy 825		Incoloy 825, Nylon	3	15	600	Sour		0	120	91441
39	CS	ASTM A106-B/A333-6	Incoloy 825, Stellite 6		Incoloy 825		Incoloy 825, Nylon	3	15	600	Sour		0	120	151441
40	CS	ASTM A106-B/A333-6	Incoloy 825, Stellite 6		Incoloy 825		Incoloy 825, Nylon	3	15	300	Sour		0	120	251441
41	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS, AISI 316 (L), Nylon	3	15	400	Sour		0	120	91520
42	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS, AISI 316 (L), Nylon	3	15	400	Sour		0	120	151520
43	CS	ASTM A106-B/A333-6	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		CS, AISI 316 (L), Nylon	3	15	300	Sour		0	120	251520
44	CS	ASTM A106-B/A333-6	Incoloy 825, Stellite 6		Incoloy 825		Incoloy 825, Nylon	3	15	400	Sour		0	120	91521

MATERIALS SELECTION (continued)

Material		Valve Trim			Valve Internal		CA	Diameter (DN)		Sour	Low Temp.	Design Temp. °C		Piping Class
Group	Pipe	Gate, Globe, Check	Butterfly	Check, wafer lug	Ball valve (BS)	Ball valve (API)		mm	min max			Min	Max	
45	CS	ASTM A106-B/A333-6	Incoloy 825, Stellite 6	Incoloy 825		Incoloy 825, Nylon	3	15	400	Sour		0	120	151521
46	CS	ASTM A106-B/A333-6	Incoloy 825, Stellite 6	Incoloy 825		Incoloy 825, Nylon	3	15	300	Sour		0	120	251521
47	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	AISI 316(L), PTFE	1	15	600		LT	-50	120	11470
48	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	1	15	600		LT	-50	120	31470
49	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS+ENP, AISI 316(L), Nylon	1	15	400		LT	-50	120	61470
50	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS+ENP, AISI 316(L), Nylon	1	15	400		LT	-50	120	91470
51	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS+ENP, AISI 316(L), Nylon	1	15	400		LT	-50	120	151470
52	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	AISI 316(L), PTFE	1	15	600	Sour	LT	-50	120	11480
53	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	1	15	600	Sour	LT	-50	120	31480
54	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS+ENP, AISI 316(L), Nylon	1	15	400	Sour	LT	-50	120	61480
55	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS+ENP, AISI 316(L), Nylon	1	15	400	Sour	LT	-50	120	91480
56	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS+ENP, AISI 316(L), Nylon	1	15	400	Sour	LT	-50	120	151480
57	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	AISI 316(L), PTFE	3	15	600		LT	-50	120	11490
58	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	600		LT	-50	120	31490
59	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS, AISI 316(L), Nylon	3	15	400		LT	-50	120	61490
60	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS, AISI 316(L), Nylon	3	15	400		LT	-50	120	91490
61	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS, AISI 316(L), Nylon	3	15	400		LT	-50	120	151490
62	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	AISI 316(L), PTFE	3	15	600	Sour	LT	-50	120	11500
63	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	3	15	600	Sour	LT	-50	120	31500
64	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS, AISI 316(L), Nylon	3	15	400	Sour	LT	-50	120	61500
65	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS, AISI 316(L), Nylon	3	15	400	Sour	LT	-50	120	91500
66	CS Fine grained	ASTM A333-6	AISI 316(L), Stellite 6			CS, AISI 316(L), Nylon	3	15	400	Sour	LT	-50	120	151500
67	CS Fine grained	ASTM A333-6	Incoloy 825, Stellite 6	Incoloy 825, Stellite 6	Incoloy 825, PTFE	Incoloy 825, PTFE	3	15	600	Sour	LT	-50	120	11501
68	CS Fine grained	ASTM A333-6	Incoloy 825, Stellite 6	Incoloy 825, Stellite 6		Incoloy 825, PTFE	3	15	600	Sour	LT	-50	120	31501
69	CS Fine grained	ASTM A333-6	Incoloy 825, Stellite 6			Incoloy 825, Nylon	3	15	400	Sour	LT	-50	120	61501
70	CS Fine grained	ASTM A333-6	Incoloy 825, Stellite 6			Incoloy 825, Nylon	3	15	400	Sour	LT	-50	120	91501
71	CS Fine grained	ASTM A333-6	Incoloy 825, Stellite 6			Incoloy 825, Nylon	3	15	400	Sour	LT	-50	120	151501
72	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	0	15	600			-20	120	13410
73	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		0	15	300			-20	120	33410
74	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6			AISI 316(L), Nylon	0	15	200			-20	120	63410
75	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6			AISI 316(L), Nylon	0	15	200			-20	120	93410
76	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6			AISI 316(L), Nylon	0	15	200			-20	120	153410
77	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	0	15	600	Sour		-20	120	13420
78	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	0	15	300	Sour		-20	120	33420
79	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6			AISI 316(L), Nylon	0	15	200	Sour		-20	120	63420
80	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6			AISI 316(L), Nylon	0	15	200	Sour		-20	120	93420
81	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6			AISI 316(L), Nylon	0	15	200	Sour		-20	120	153420
82	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6				0	15	600			-20	200	13430
83	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6				0	15	300			-20	200	33430
84	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6				0	15	200			-20	200	63430
85	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6				0	15	200			-20	200	93430
86	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6				0	15	200			-20	200	153430
87	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	AISI 316(L), PTFE	0	15	600		LT	-100	120	13450
88	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	0	15	300		LT	-100	120	33450

MATERIALS SELECTION (continued)

Material							CA	Diameter		Low	Design		Piping	
Group	Pipe	Valve Trim			Valve Internal			(DN)	Sour		Temp.	Min	Max	Class
		Gate, Globe, Check	Butterfly	Check, wafer lug	Ball valve (BS)	Ball valve (API)								
							mm	min	max				Number	
89	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		AISI 316(L), PCTFE	0	15 200		LT	-100 120	63450	
90	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		AISI 316(L), PCTFE	0	15 200		LT	-100 120	93450	
91	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		AISI 316(L), PCTFE	0	15 150		LT	-100 120	153450	
92	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), PTFE	AISI 316(L), PTFE	0	15 600	Sour	LT	-73 120	13460	
93	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6	AISI 316(L), Stellite 6		AISI 316(L), PTFE	0	15 300	Sour	LT	-73 120	33460	
94	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		AISI 316(L), PCTFE	0	15 200	Sour	LT	-73 120	63460	
95	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		AISI 316(L), PCTFE	0	15 200	Sour	LT	-73 120	93460	
96	SS AISI 316	ASTM A312-TP316L/A358-316L	AISI 316(L), Stellite 6		AISI 316(L), Stellite 6		AISI 316(L), PCTFE	0	15 150	Sour	LT	-73 120	153460	
97	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex	Duplex, Stellite 6	Duplex	Duplex, PTFE	Duplex, PTFE	0	15 600			-20 120	13831	
98	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex	Duplex, Stellite 6	Duplex		Duplex, PTFE	0	15 600			-20 120	33831	
99	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 600			-20 120	63831	
100	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 600			-20 120	93831	
101	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 400			-20 120	153831	
102	Duplex	ASTM A790 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 150			-20 120	253831	
103	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex	Duplex, Stellite 6	Duplex	Duplex, PTFE	Duplex, PTFE	0	15 600	Sour		-20 120	13832	
104	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex	Duplex, Stellite 6	Duplex		Duplex, PTFE	0	15 600	Sour		-20 120	33832	
105	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 600	Sour		-20 120	63832	
106	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 600	Sour		-20 120	93832	
107	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 500	Sour		-20 120	153832	
108	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 300	Sour		-20 120	253832	
109	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex	Duplex, Stellite 6	Duplex	Duplex, PTFE	Duplex, PTFE	0	15 600		LT	-50 120	13833	
110	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex	Duplex, Stellite 6	Duplex		Duplex, PTFE	0	15 600		LT	-50 120	33833	
111	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 600		LT	-50 120	63833	
112	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 400		LT	-50 120	93833	
113	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 250		LT	-50 120	153833	
114	Duplex	ASTM A790 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 150		LT	-50 120	253833	
115	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex	Duplex, Stellite 6	Duplex	Duplex, PTFE	Duplex, PTFE	0	15 600	Sour	LT	-50 120	13834	
116	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex	Duplex, Stellite 6	Duplex		Duplex, PTFE	0	15 600	Sour	LT	-50 120	33834	
117	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 600	Sour	LT	-50 120	63834	
118	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 400	Sour	LT	-50 120	93834	
119	Duplex	ASTM A790/A928 cl 1 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 250	Sour	LT	-50 120	153834	
120	Duplex	ASTM A790 UNS S31803	Duplex		Duplex		Duplex, Nylon	0	15 150	Sour	LT	-50 120	253834	
121	Titanium	ASTM B337-2						0	15 150			0 50	16410	
122	CS Galvanised	API 5L-B (Galvanised)	ASTM B148		ASTM B148, PTFE	ASTM B148, PTFE		0	15 100			0 60	18410	
123	CS Galvanised	API 5L-B (Galvanised)	ASTM B283 (diaph v)					0	15 100			0 60	18420	

NOTES:

*) AISI 316+stellite 6 for sizes DN 15 to DN 40

4.2 VALVE, GASKET AND BOLT SELECTION

Piping Class Number	Ball valve						Gate valve		Butterfly valve		Check valve				Globe valve		Diaphr. 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		type	inner ring	outer ring	filler material					
1	11410	RFrb	015	600	RFfb	015	600			WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7	
2	31410	RFrb	050	600	RFfb	050	600	RF	015	040	WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7
3	61410	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW		CS	Graphite/316(L)	B7
4	91410	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7
5	151410	RFrb	050	400	RFfb	050	400	RF	015	040				RF	015	600	WL	050	600	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7
6	251410	RFrb	050	300	RFfb	050	300							RF	015	300	WL	050	300	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7
7	11420	RFrb	015	600	RFfb	015	600				WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7M
8	31420	RFrb	050	600	RFfb	050	600	RF	015	040	WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7M
9	61420	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW		CS	Graphite/316(L)	B7M
10	91420	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7M
11	151420	RFrb	050	400	RFfb	050	400	RF	015	040				RF	015	600	WL	050	600	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
12	251420	RFrb	050	300	RFfb	050	300							RF	015	300	WL	050	300	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
13	11450						RF	015	600					RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7
14	31450						RF	015	600					RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7
15	61450						RF	015	600					RF	015	600	WL	050	600	RF	015	150	SPW		CS	Graphite/316(L)	B7
16	91450						RF	015	600					RF	015	600	WL	050	600	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7
17	151450						RF	015	600					RF	015	600	WL	050	600	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7
18	11460						RF	015	600					RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7M
19	31460						RF	015	600					RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7M
20	61460						RF	015	600					RF	015	600	WL	050	600	RF	015	150	SPW		CS	Graphite/316(L)	B7M
21	91460						RF	015	600					RF	015	600	WL	050	600	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7M
22	151460						RF	015	600					RF	015	600	WL	050	600	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
23	11430	RFrb	015	600	RFfb	015	600				WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7
24	31430	RFrb	050	600	RFfb	050	600	RF	015	040	WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7
25	61430	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW		CS	Graphite/316(L)	B7
26	91430	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7
27	151430	RFrb	050	400	RFfb	050	400	RF	015	040				RF	015	600	WL	050	600	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7
28	251430	RFrb	050	300	RFfb	050	300							RF	015	300	WL	050	300	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7
29	11440	RFrb	015	600	RFfb	015	600				WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7M
30	31440	RFrb	050	600	RFfb	050	600	RF	015	040	WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7M
31	61440	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW		CS	Graphite/316(L)	B7M
32	91440	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7M
33	151440	RFrb	050	400	RFfb	050	400	RF	015	040				RF	015	600	WL	050	600	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
34	251440	RFrb	050	300	RFfb	050	300							RF	015	300	WL	050	300	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
35	11441	RFrb	015	600	RFfb	015	600				WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7M
36	31441	RFrb	050	600	RFfb	050	600	RF	015	040	WL	150	600	RF	015	600	WL	050	600	RF	015	200	TI			Graphite	B7M
37	61441	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW		CS	Graphite/316(L)	B7M
38	91441	RFrb	050	600	RFfb	050	600	RF	015	040				RF	015	600	WL	050	600	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7M
39	151441	RFrb	050	400	RFfb	050	400	RF	015	040				RF	015	600	WL	050	600	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
40	251441	RFrb	050	300	RFfb	050	300							RF	015	300	WL	050	300	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
41	91520	RFrb	050	400	RFfb	050	400	RF	015	040				RF	015	400	WL	050	400	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7M
42	151520	RFrb	050	400	RFfb	050	400	RF	015	040				RF	015	400	WL	050	400	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
43	251520	RFrb	050	300	RFfb	050	300							RF	015	300	WL	050	300	RF	015	100	SPW	316(L)	CS	Graphite/316(L)	B7M
44	91521	RFrb	050	400	RFfb	050	400	RF	015	040				RF	015	400	WL	050	400	RF	015	150	SPW	316(L)	CS	Graphite/316(L)	B7M

VALVE, GASKET AND BOLT SELECTION (continued)

	Piping Class Number	Ball valve				Gate valve		Butterfly valve		Check valve				Globe valve		Diaphr. 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		type	inner ring	outer ring	filler material		
45	151521	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	B7M		
46	251521	RFrb	050 300	RFfb	050 300					RF	015 300	WL	050 300	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	B7M		
47	11470	RFrb	015 600	RFfb	015 600			WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7		
48	31470	RFrb	050 600	RFfb	050 600	RF	015 040	WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7		
49	61470	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW		CS	Graphite/316(L)	L7		
50	91470	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW	316(L)	CS	Graphite/316(L)	L7		
51	151470	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	L7		
52	11480	RFrb	015 600	RFfb	015 600			WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7M		
53	31480	RFrb	050 600	RFfb	050 600	RF	015 040	WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7M		
54	61480	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW		CS	Graphite/316(L)	L7M		
55	91480	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW	316(L)	CS	Graphite/316(L)	L7M		
56	151480	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	L7M		
57	11490	RFrb	015 600	RFfb	015 600			WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7		
58	31490	RFrb	050 600	RFfb	050 600	RF	015 040	WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7		
59	61490	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW		CS	Graphite/316(L)	L7		
60	91490	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW	316(L)	CS	Graphite/316(L)	L7		
61	151490	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	L7		
62	11500	RFrb	015 600	RFfb	015 600			WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7M		
63	31500	RFrb	050 600	RFfb	050 600	RF	015 040	WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7M		
64	61500	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW		CS	Graphite/316(L)	L7M		
65	91500	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW	316(L)	CS	Graphite/316(L)	L7M		
66	151500	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	L7M		
67	11501	RFrb	015 600	RFfb	015 600			WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7M		
68	31501	RFrb	050 600	RFfb	050 600	RF	015 040	WL	150 600	RF	015 600	WL	050 600	RF	015 200		TI			Graphite	L7M		
69	61501	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW		CS	Graphite/316(L)	L7M		
70	91501	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 150		SPW	316(L)	CS	Graphite/316(L)	L7M		
71	151501	RFrb	050 400	RFfb	050 400	RF	015 040			RF	015 400	WL	050 400	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	L7M		
72	13410	RFrb	015 600	RFfb	015 600			WL	150 600	RF	015 400	WL	050 600	RF	015 200		TI			Graphite	B7		
73	33410	RFrb	050 300	RFfb	050 300	RF	015 040	WL	150 300	RF	015 300	WL	050 300	RF	015 200		TI			Graphite	B7		
74	63410	RFrb	050 200	RFfb	050 200	RF	015 040			RF	015 200	WL	050 200	RF	015 150		SPW		CS	Graphite/316(L)	B7		
75	93410	RFrb	050 200	RFfb	050 200	RF	015 040			RF	015 200	WL	050 200	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	B7		
76	153410	RFrb	050 100	RFfb	050 100	RF	015 040			RF	015 100	WL	050 100	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	B7		
77	13420	RFrb	015 600	RFfb	015 600			WL	150 600	RF	015 400	WL	050 600	RF	015 200		TI			Graphite	B7M		
78	33420	RFrb	050 300	RFfb	050 300	RF	015 040	WL	150 300	RF	015 300	WL	050 300	RF	015 200		TI			Graphite	B7M		
79	63420	RFrb	050 200	RFfb	050 200	RF	015 040			RF	015 200	WL	050 200	RF	015 150		SPW		CS	Graphite/316(L)	B7M		
80	93420	RFrb	050 200	RFfb	050 200	RF	015 040			RF	015 200	WL	050 200	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	B7M		
81	153420	RFrb	050 200	RFfb	050 200	RF	015 040			RF	015 200	WL	050 200	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	B7M		
82	13430					RF	015 600			RF	015 400	WL	050 600	RF	015 200		TI			Graphite	B7		
83	33430					RF	015 300			RF	015 300	WL	050 300	RF	015 200		TI			Graphite	B7		
84	63430					RF	015 200			RF	015 200	WL	050 200	RF	015 150		SPW		CS	Graphite/316(L)	B7		
85	93430					RF	015 200			RF	015 200	WL	050 200	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	B7		
86	153430					RF	015 200			RF	015 200	WL	050 200	RF	015 100		SPW	316(L)	CS	Graphite/316(L)	B7		
87	13450	RFrb	015 600	RFfb	015 600			WL	150 600	RF	015 400	WL	050 600	RF	015 200		TI			Graphite	L7		
88	33450	RFrb	050 300	RFfb	050 300	RF	015 040	WL	150 300	RF	015 300	WL	050 300	RF	015 200		TI			Graphite	L7		

VALVE, GASKET AND BOLT SELECTION (continued)

	Piping Class Number	Ball valve				Gate valve	Butterfly valve	Check valve				Globe valve	Diaphr. 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	type	inner ring	outer ring	filler material		
89	63450	RFrb 050 200	RFfb 050 200	RF 015 040				RF 015 200	WL 050 200	RF 015 150		SPW		CS	Graphite/316(L)	L7		
90	93450	RFrb 050 200	RFfb 050 200	RF 015 040				RF 015 200	WL 050 200	RF 015 100		SPW	316(L)	CS	Graphite/316(L)	L7		
91	153450	RFrb 050 150	RFfb 050 150	RF 015 040				RF 015 150	WL 050 150	RF 015 100		SPW	316(L)	CS	Graphite/316(L)	L7		
92	13460	RFrb 015 600	RFfb 015 600			WL 150 600		RF 015 400	WL 050 600	RF 015 200		TI			Graphite	L7M		
93	33460	RFrb 050 300	RFfb 050 300	RF 015 040		WL 150 300		RF 015 300	WL 050 300	RF 015 200		TI			Graphite	L7M		
94	63460	RFrb 050 200	RFfb 050 200	RF 015 040				RF 015 200	WL 050 200	RF 015 150		SPW		CS	Graphite/316(L)	L7M		
95	93460	RFrb 050 200	RFfb 050 200	RF 015 040				RF 015 200	WL 050 200	RF 015 100		SPW	316(L)	CS	Graphite/316(L)	L7M		
96	153460	RFrb 050 150	RFfb 050 150	RF 015 040				RF 015 150	WL 050 150	RF 015 100		SPW	316(L)	CS	Graphite/316(L)	L7M		
97	13831	RFrb 015 600	RFfb 015 600			WL 150 600		RF 015 040	WL 050 600	RF 015 200		TI			Graphite	B7		
98	33831	RFrb 050 600	RFfb 050 600	RF 015 040		WL 150 600		RF 015 040	WL 050 600	RF 015 200		TI			Graphite	B7		
99	63831	RFrb 050 600	RFfb 050 600	RF 015 040				RF 015 040	WL 050 600	RF 015 150		SPW	Duplex	Duplex	Graphite/Inconel	B7		
100	93831	RFrb 050 600	RFfb 050 600	RF 015 040				RF 015 040	WL 050 600	RF 015 150		SPW	Duplex	Duplex	Graphite/Inconel	B7		
101	153831	RFrb 050 400	RFfb 050 400	RF 015 040				RF 015 040	WL 050 400	RF 015 100		SPW	Duplex	Duplex	Graphite/Inconel	B7		
102	253831	RFrb 050 150	RFfb 050 150	RF 015 040				RF 015 040	WL 050 150	RF 015 100		SPW	Duplex	Duplex	Graphite/Inconel	B7		
103	13832	RFrb 015 600	RFfb 015 600			WL 150 600		RF 015 040	WL 050 600	RF 015 200		TI			Graphite	B7M		
104	33832	RFrb 050 600	RFfb 050 600	RF 015 040		WL 150 600		RF 015 040	WL 050 600	RF 015 200		TI			Graphite	B7M		
105	63832	RFrb 050 600	RFfb 050 600	RF 015 040				RF 015 040	WL 050 600	RF 015 150		SPW	Duplex	Duplex	Graphite/Inconel	B7M		
106	93832	RFrb 050 600	RFfb 050 600	RF 015 040				RF 015 040	WL 050 600	RF 015 150		SPW	Duplex	Duplex	Graphite/Inconel	B7M		
107	153832	RFrb 050 400	RFfb 050 400	RF 015 040				RF 015 040	WL 050 500	RF 015 100		SPW	Duplex	Duplex	Graphite/Inconel	B7M		
108	253832	RFrb 050 300	RFfb 050 300	RF 015 040				RF 015 040	WL 050 300	RF 015 100		SPW	Duplex	Duplex	Graphite/Inconel	B7M		
109	13833	RFrb 015 600	RFfb 015 600			WL 150 600		RF 015 040	WL 050 600	RF 015 200		TI			Graphite	L7		
110	33833	RFrb 050 600	RFfb 050 600	RF 015 040		WL 150 600		RF 015 040	WL 050 600	RF 015 200		TI			Graphite	L7		
111	63833	RFrb 050 600	RFfb 050 600	RF 015 040				RF 015 040	WL 050 600	RF 015 150		SPW	Duplex	Duplex	Graphite/Inconel	L7		
112	93833	RFrb 050 400	RFfb 050 400	RF 015 040				RF 015 040	WL 050 400	RF 015 150		SPW	Duplex	Duplex	Graphite/Inconel	L7		
113	153833	RFrb 050 250	RFfb 050 250	RF 015 040				RF 015 040	WL 050 250	RF 015 100		SPW	Duplex	Duplex	Graphite/Inconel	L7		
114	253833	RFrb 050 150	RFfb 050 150	RF 015 040				RF 015 040	WL 050 150	RF 015 100		SPW	Duplex	Duplex	Graphite/Inconel	L7		
115	13834	RFrb 015 600	RFfb 015 600			WL 150 600		RF 015 040	WL 050 600	RF 015 200		TI			Graphite	L7M		
116	33834	RFrb 050 600	RFfb 050 600	RF 015 040		WL 150 600		RF 015 040	WL 050 600	RF 015 200		TI			Graphite	L7M		
117	63834	RFrb 050 600	RFfb 050 600	RF 015 040				RF 015 040	WL 050 600	RF 015 150		SPW	Duplex	Duplex	Graphite/Inconel	L7M		
118	93834	RFrb 050 400	RFfb 050 400	RF 015 040				RF 015 040	WL 050 400	RF 015 150		SPW	Duplex	Duplex	Graphite/Inconel	L7M		
119	153834	RFrb 050 250	RFfb 050 250	RF 015 040				RF 015 040	WL 050 250	RF 015 100		SPW	Duplex	Duplex	Graphite/Inconel	L7M		
120	253834	RFrb 050 150	RFfb 050 150	RF 015 040				RF 015 040	WL 050 150	RF 015 100		SPW	Duplex	Duplex	Graphite/Inconel	L7M		
121	16410		WLrb 015 150									TI			Graphite	B8M2		
122	18410	THrb 015 050	FFrb 015 100					TH 015 050	WL 050 100	TH 015 050		FF/TI			Graphite	B7		
123	18420											RF/TH 025 100	FF/TI		Graphite	B7		

Valve Codes:

RF = flanged end with raised face
FF = flanged end with flat face
WL = wafer lug type
TH = threaded end
rb = reduced bore
fb = full bore

Gasket Codes:

TI = tanged insert
SPW = spiral wound gasket
RF = raised face
FF = flat face
PTFE = teflon

Bolting Codes:

B7 = ASTM A 193 - B7
B7M = ASTM A 193 - B7M
L7 = ASTM A 320 - L7
L7M = ASTM A 320 - L7M
B8M2 = ASTM A 193 - B8M, Class 2

Bolts:

Nuts:

ASTM A 194 - B2H
ASTM A 194 - 2HM
ASTM A 194 - 4
ASTM A 194 - 7M
ASTM A 194 - 8M

5. PIPING CLASSES

The remainder of this binder contains the SIEP piping classes, with separate tabbed sections for ANSI 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 11410

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS				
	0	50	75	100	120

	PRESSURE BAR GA				
DN15 -600	19.6	19.2	18.4	17.6	16.9

- 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.
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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 80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20 80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25 80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40 80
350	C	C	C	C	E	E	E	B	B	B	B	A					50 40
300	C	C	C	C	E	E	E	B	B	B	A						80 40
250	C	C	C	C	E	E	E	B	B	A							100 40
200	C	C	C	C	E	E	B	B	A								150 40
150	C	C	C	C	E	B	B	A									200 20
100	C	C	C	B	B	B	A										250 20
80	C	C	C	B	B	A											300 20
50	C	B	B	B	A												350 20
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 11410	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 11410, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

API5	PIPE (API 5L-B)	DN 15-350	API 5L-B (SML)
		DN400-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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,A105 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
BTFF	BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT+ENP,AISI 316
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT+ENP,AISI 316
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
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: AISI 316,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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1				
	74.13.17													419.1	469.1	521.1	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
* 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 FULL BORE FLANGED	77.00.03	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1								
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						
BALL VALVE FULL BORE TRUN FLGD	77.00.72									515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.00.72											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.57.40								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1												
	77.10.23					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	77.67.51					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												
	77.30.23					008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.00.95	403.1	404.1	405.1	407.1	408.1											
* 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	76.64.96	052.1	054.1	056.1	058.1												
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	76.83.37.121.1
813	76.80.60.044.1	255	76.83.37.122.1
1219	76.80.60.046.1	305	76.83.37.123.1
1524	76.80.60.048.1	355	76.83.37.125.1
1829	76.80.60.050.1	405	76.83.37.126.1
2134	76.80.60.052.1	455	76.83.37.127.1
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 API609 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	* 80	61.269.1
80	4	5/8	* 90	61.271.1	80	4	5/8	* 100	61.273.1
100	8	5/8	* 100	61.273.1	100	8	5/8	* 100	61.273.1
150	8	3/4	* 110	61.330.1	150	8	3/4	* 100	61.329.1
200	8	3/4	* 110	61.330.1	200	8	3/4	* 110	61.330.1
250	12	7/8	* 130	61.403.1	250	12	7/8	* 120	61.401.1
300	12	7/8	* 140	61.404.1	300	12	7/8	* 120	61.401.1
350	12	1	* 150	61.471.1	350	12	1	* 130	61.468.1
400	16	1	* 160	61.472.1	400	16	1	* 140	61.469.1
450	16	1 1/8	* 180	61.533.1	450	16	1 1/8	* 150	61.529.1
500	20	1 1/8	* 190	61.535.1	500	20	1 1/8	* 160	61.530.1
600	20	1 1/4	* 230	61.598.1	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.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.403.1	
WELDING NECK FLANGE	1	76.62.78.352.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
WELDING NECK FLANGE	1	76.62.78.354.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
WELDING NECK FLANGE	2	76.62.78.352.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.78.352.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.78.352.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.013.1	
WELDING NECK FLANGE	1	76.62.78.352.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	
WELDING NECK FLANGE	1	76.62.78.354.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	

CLASS 11420

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS				
	0	50	75	100	120
-----	-----				
	PRESSURE BAR GA				
DN15 -600	19.6	19.2	18.4	17.6	16.9

- 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.
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C
MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40
300	C	C	C	C	E	E	E	B	B	B	A						80	40
250	C	C	C	C	E	E	E	B	B	A							100	40
200	C	C	C	C	E	E	B	B	A								150	40
150	C	C	C	C	E	B	B	A									200	20
100	C	C	C	B	B	B	A										250	20
80	C	C	C	B	B	A											300	20
50	C	B	B	B	A												350	20
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 11420	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* 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
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,A105 TRIM: AISI 316 (L) ,PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) ,PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT+ENP,AISI 316
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT+ENP,AISI 316
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
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: AISI 316,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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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
* 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 FULL BORE FLANGED	77.00.03	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1								
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						
BALL VALVE FULL BORE TRUN FLGD	77.00.72									515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.00.72											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.57.40								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1												
	77.10.23					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	77.67.51					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												
	77.30.23					008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.00.95	403.1	404.1	405.1	407.1	408.1											
* 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	76.64.96	052.1	054.1	056.1	058.1												
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.66.052.1	450	76.81.66.552.1
840	76.81.66.054.1	840	76.81.66.554.1
1230	76.81.66.056.1	1230	76.81.66.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.402.1	230	76.83.37.121.1
813	76.80.60.404.1	255	76.83.37.122.1
1219	76.80.60.406.1	305	76.83.37.123.1
1524	76.80.60.408.1	355	76.83.37.125.1
1829	76.80.60.410.1	405	76.83.37.126.1
2134	76.80.60.412.1	455	76.83.37.127.1
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 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

BOLTSET WAFER CHECK VALVE

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	4	5/8	* 90	66.271.1	50	4	5/8	* 150	66.281.1
80	4	5/8	* 110	66.274.1	80	4	5/8	* 170	66.284.1
100	8	5/8	* 110	66.274.1	100	8	5/8	* 170	66.284.1
150	8	3/4	* 120	66.332.1	150	8	3/4	* 210	66.346.1
200	8	3/4	* 130	66.334.1	200	8	3/4	* 240	66.351.1
250	12	7/8	* 140	66.404.1	250	12	7/8	* 290	66.428.1
300	12	7/8	* 150	66.406.1	300	12	7/8	* 310	66.432.1
350	12	1	* 160	66.472.1	350	12	1	* 330	66.500.1
400	16	1	* 170	66.474.1	400	16	1	* 330	66.500.1
450	16	1 1/8	* 180	66.533.1	450	16	1 1/8	* 360	66.562.1
500	20	1 1/8	* 200	66.525.1	500	20	1 1/8	* 390	66.566.1
600	20	1 1/4	* 220	66.597.1	600	20	1 1/4	* 400	66.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.403.1	
WELDING NECK FLANGE	1	76.62.78.352.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
WELDING NECK FLANGE	1	76.62.78.354.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
WELDING NECK FLANGE	2	76.62.78.352.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.78.352.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.78.352.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.013.1	
WELDING NECK FLANGE	1	76.62.78.352.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	
WELDING NECK FLANGE	1	76.62.78.354.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	

CLASS 11430

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 19.6 19.2 18.4 17.6 16.9

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.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	B	A	20 160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25 160
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40 160
350	C	C	C	C	E	E	E	B	B	B	B	A					50 80
300	C	C	C	C	E	E	E	B	B	B	A						80 80
250	C	C	C	C	E	E	E	B	B	A							100 80
200	C	C	C	C	E	E	B	B	A								150 80
150	C	C	C	C	E	B	B	A									200 40
100	C	C	C	B	B	B	A										250 40
80	C	C	C	B	B	A											300 40
50	C	B	B	B	A												350 40
40	B	B	B	A													400 40
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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 11430	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

API5	PIPE (API 5L-B)	DN 15-350	API 5L-B (SML)
		DN400-600	API 5L-B (WLD)
PIPE	PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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,A105 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
BTFF	BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A216+ENP,A105+ENP TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A216+ENP,A105+ENP TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
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: AISI 316,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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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
TWGS	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1				
	74.13.17													433.1	477.1	529.1	579.1
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	477.1	529.1	579.1
* 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	364.1	366.1	318.1	320.1	322.1	324.1	326.1	268.1	270.1	274.1
* 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	236.1	257.1	278.1
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	786.1	807.1	828.1
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	786.1	807.1	828.1
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	786.1	807.1	828.1
* VALVES																	
BALL VALVE FULL BORE FLANGED	77.00.03	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1								
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						
BALL VALVE FULL BORE TRUN FLGD	77.00.73									515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.00.73											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.57.40								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1												
	77.10.23					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	77.67.51					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												
	77.30.23					008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.00.95	403.1	404.1	405.1	407.1	408.1											
* 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	76.64.96	052.1	054.1	056.1	058.1												
ORIFICE FLANGE SET	76.62.95					760.1	762.1	614.1	616.1	568.1	620.1	622.1	624.1	626.1	518.1	520.1	524.1
STRAINER Y-TYPE	76.83.19					426.1	428.1	430.1	432.1	434.1	436.1	438.1	440.1	442.1			

	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	79.01.268.1			
80* 40		30.72.229.1	30.73.229.1	30.89.129.1	450* 80	79.01.280.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*100	79.01.292.1			
100* 40		30.72.253.1	30.73.253.1	30.89.147.1	450*150	79.01.303.1			
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*200	79.00.414.1	30.72.510.1	30.73.510.1	30.89.589.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*250	79.00.422.1	30.72.534.1	30.73.534.1	30.89.613.1
150* 50	79.01.364.1				450*300	79.00.429.1	30.72.564.1	30.73.564.1	30.89.637.1
150* 80	79.01.388.1	30.72.297.1	30.73.297.1	30.89.178.1	450*350	79.00.435.1	30.72.596.1	30.73.596.1	30.89.661.1
150*100	79.01.410.1	30.72.307.1	30.73.307.1	30.89.190.1	450*400	79.00.440.1	30.72.626.1	30.73.626.1	30.89.685.1
200* 50	79.01.066.1				500* 50	79.01.269.1			
200* 80	79.01.090.1				500* 80	79.01.281.1			
200*100	79.01.112.1	30.72.326.1	30.73.326.1	30.89.212.1	500*100	79.01.293.1			
200*150	79.01.132.1	30.72.336.1	30.73.336.1	30.89.232.1	500*150	79.01.304.1			
250* 50	79.01.068.1				500*200	79.00.415.1	29.46.910.1	29.61.910.1	30.89.709.1
250* 80	79.01.092.1				500*250	79.00.423.1	29.46.943.1	29.61.943.1	30.89.733.1
250*100	79.01.114.1	29.46.344.1	29.61.344.1	30.89.260.1	500*300	79.00.430.1	30.72.654.1	30.73.654.1	30.89.757.1
250*150	79.01.134.1	30.72.356.1	30.73.356.1	30.89.278.1	500*350	79.00.436.1	30.72.686.1	30.73.686.1	30.89.781.1
250*200	79.00.902.1	30.72.365.1	30.73.365.1	30.89.291.1	500*400	79.00.441.1	30.72.716.1	30.73.716.1	30.89.805.1
300* 50	79.01.070.1				500*450	79.00.528.1	30.72.732.1	30.73.732.1	30.89.819.1
300* 80	79.01.094.1				600* 50	79.01.271.1			
300*100	79.01.116.1				600* 80	79.01.283.1			
300*150	79.01.136.1	30.72.380.1	30.73.380.1	30.89.317.1	600*100	79.01.295.1			
300*200	79.00.904.1	30.72.396.1	30.73.396.1	30.89.328.1	600*150	79.01.306.1			
300*250	79.00.920.1	30.72.404.1	30.73.404.1	30.89.350.1	600*200	79.00.417.1			
350* 50	79.01.072.1				600*250	79.00.425.1	30.72.810.1	30.73.810.1	30.89.853.1
350* 80	79.01.096.1				600*300	79.00.432.1	30.72.830.1	30.73.830.1	30.89.877.1
350*100	79.01.118.1				600*350	79.00.438.1	30.72.850.1	30.73.850.1	30.89.901.1
350*150	79.01.138.1	29.46.604.1	29.61.604.1	30.89.379.1	600*400	79.00.443.1	30.72.896.1	30.73.896.1	30.89.925.1
350*200	79.00.906.1	30.72.422.1	30.73.422.1	30.89.390.1	600*450	79.00.532.1	30.72.912.1	30.73.912.1	30.89.939.1
350*250	79.00.922.1	30.72.438.1	30.73.438.1	30.89.415.1	600*500	79.00.538.1	30.72.942.1	30.73.942.1	30.89.963.1
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	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	76.83.37.121.1
813	76.80.60.044.1	255	76.83.37.122.1
1219	76.80.60.046.1	305	76.83.37.123.1
1524	76.80.60.048.1	355	76.83.37.125.1
1829	76.80.60.050.1	405	76.83.37.126.1
2134	76.80.60.052.1	455	76.83.37.127.1
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 API609 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	* 80	61.269.1
80	4	5/8	* 90	61.271.1	80	4	5/8	* 100	61.273.1
100	8	5/8	* 100	61.273.1	100	8	5/8	* 100	61.273.1
150	8	3/4	* 110	61.330.1	150	8	3/4	* 100	61.329.1
200	8	3/4	* 110	61.330.1	200	8	3/4	* 110	61.330.1
250	12	7/8	* 130	61.403.1	250	12	7/8	* 120	61.401.1
300	12	7/8	* 140	61.404.1	300	12	7/8	* 120	61.401.1
350	12	1	* 150	61.471.1	350	12	1	* 130	61.468.1
400	16	1	* 160	61.472.1	400	16	1	* 140	61.469.1
450	16	1 1/8	* 180	61.533.1	450	16	1 1/8	* 150	61.529.1
500	20	1 1/8	* 190	61.535.1	500	20	1 1/8	* 160	61.530.1
600	20	1 1/4	* 230	61.598.1	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.DF 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
MONOFL SINGLE BLOCK BALL 1 77.00.95.403.1
WELDING NECK FLANGE 1 76.62.78.402.1

* DRAIN POINT DN 20 FIG.DF 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
MONOFL SINGLE BLOCK BALL 1 77.00.95.404.1
WELDING NECK FLANGE 1 76.62.78.404.1

* DRAIN POINT DN 20 FIG.DE 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
MONOFL SINGLE BLOCK BALL 1 77.00.95.404.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.003.1
WELDING NECK FLANGE 2 76.62.78.402.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.003.1
WELDING NECK FLANGE 1 76.62.78.402.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.003.1

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* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.003.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.003.1
WELDING NECK FLANGE 1 76.62.78.402.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.003.1

* 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 76.83.37.121.1

* 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 76.83.37.122.1

* VENT POINT DN 15 FIG.DF 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.013.1
WELDING NECK FLANGE 1 76.62.78.402.1

* VENT POINT DN 20 FIG.DF 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.014.1
WELDING NECK FLANGE 1 76.62.78.404.1

* VENT POINT DN 20 FIG.DE 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.014.1

CLASS 11440

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA

DN15 -600 19.6 19.2 18.4 17.6 16.9

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.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE
BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING
REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE
SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C
MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC
DESCRIPTION) FOR 80+ DEG. C.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE
IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE
INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	B	B	B	B	A			25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	80
300	C	C	C	C	E	E	E	B	B	B	A						80	80
250	C	C	C	C	E	E	E	B	B	A							100	80
200	C	C	C	C	E	E	B	B	A								150	80
150	C	C	C	C	E	B	B	A									200	40
100	C	C	C	B	B	B	A										250	40
80	C	C	C	B	B	A											300	40
50	C	B	B	B	A												350	40
40	B	B	B	A													400	40
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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 11440	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* 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
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,A105 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316(L),PTFE
BTFF	BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A216+ENP,A105+ENP TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A216+ENP,A105+ENP TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
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: AISI 316,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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	157.1	219.1	245.1	287.1	331.1	379.1	431.1	477.1	529.1	579.1

* 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	364.1	366.1	318.1	320.1	322.1	324.1	326.1	268.1	270.1	274.1

* 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	786.1	807.1	828.1
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	786.1	807.1	828.1
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	786.1	807.1	828.1
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	786.1	807.1	828.1

* VALVES																	
BALL VALVE FULL BORE FLANGED	77.00.03	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1								
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						
BALL VALVE FULL BORE TRUN FLGD	77.00.73									515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.00.73											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.57.40								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED	77.10.05	003.1	004.1	005.1	007.1												
	77.10.23					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	77.67.51					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												
	77.30.23					008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.00.95	403.1	404.1	405.1	407.1	408.1											

* 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	76.64.96	052.1	054.1	056.1	058.1												
ORIFICE FLANGE SET	76.62.95					760.1	762.1	614.1	616.1	568.1	620.1	622.1	624.1	626.1	518.1	520.1	524.1
STRAINER Y-TYPE	76.83.22					026.1	028.1	030.1	032.1	034.1	036.1	038.1	040.1	042.1			

	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	79.01.268.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450* 80	79.01.280.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*100	79.01.292.1			
100* 40		30.66.253.1	30.67.253.1	30.88.147.1	450*150	79.01.303.1			
100* 50	79.01.362.1	30.66.267.1	30.67.267.1	30.88.154.1	450*200	79.00.414.1	30.66.510.1	30.67.510.1	30.88.589.1
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1	450*250	79.00.422.1	30.66.534.1	30.67.534.1	30.88.613.1
150* 50	79.01.364.1				450*300	79.00.429.1	30.66.564.1	30.67.564.1	30.88.637.1
150* 80	79.01.388.1	30.66.297.1	30.67.297.1	30.88.178.1	450*350	79.00.435.1	30.66.596.1	30.67.596.1	30.88.661.1
150*100	79.01.410.1	30.66.307.1	30.67.307.1	30.88.190.1	450*400	79.00.440.1	30.66.626.1	30.67.626.1	30.88.685.1
200* 50	79.01.066.1				500* 50	79.01.269.1			
200* 80	79.01.090.1				500* 80	79.01.281.1			
200*100	79.01.112.1	30.66.326.1	30.67.326.1	30.88.212.1	500*100	79.01.293.1			
200*150	79.01.132.1	30.66.336.1	30.67.336.1	30.88.232.1	500*150	79.01.304.1			
250* 50	79.01.068.1				500*200	79.00.415.1	29.47.910.1	29.62.910.1	30.88.709.1
250* 80	79.01.092.1				500*250	79.00.423.1	29.47.943.1	29.62.943.1	30.88.733.1
250*100	79.01.114.1	29.47.344.1	29.62.344.1	30.88.260.1	500*300	79.00.430.1	30.66.654.1	30.67.654.1	30.88.757.1
250*150	79.01.134.1	30.66.356.1	30.67.356.1	30.88.278.1	500*350	79.00.436.1	30.66.686.1	30.67.686.1	30.88.781.1
250*200	79.00.902.1	30.66.365.1	30.67.365.1	30.88.291.1	500*400	79.00.441.1	30.66.716.1	30.67.716.1	30.88.805.1
300* 50	79.01.070.1				500*450	79.00.528.1	30.66.732.1	30.67.732.1	30.88.819.1
300* 80	79.01.094.1				600* 50	79.01.271.1			
300*100	79.01.116.1				600* 80	79.01.283.1			
300*150	79.01.136.1	30.66.380.1	30.67.380.1	30.88.317.1	600*100	79.01.295.1			
300*200	79.00.904.1	30.66.396.1	30.67.396.1	30.88.328.1	600*150	79.01.306.1			
300*250	79.00.920.1	30.66.404.1	30.67.404.1	30.88.350.1	600*200	79.00.417.1			
350* 50	79.01.072.1				600*250	79.00.425.1	30.66.810.1	30.67.810.1	30.88.853.1
350* 80	79.01.096.1				600*300	79.00.432.1	30.66.830.1	30.67.830.1	30.88.877.1
350*100	79.01.118.1				600*350	79.00.438.1	30.66.850.1	30.67.850.1	30.88.901.1
350*150	79.01.138.1	29.47.604.1	29.62.604.1	30.88.379.1	600*400	79.00.443.1	30.66.897.1	30.67.897.1	30.88.925.1
350*200	79.00.906.1	30.66.422.1	30.67.422.1	30.88.390.1	600*450	79.00.532.1	30.66.912.1	30.67.912.1	30.88.939.1
350*250	79.00.922.1	30.66.438.1	30.67.438.1	30.88.415.1	600*500	79.00.538.1	30.66.942.1	30.67.942.1	30.88.963.1
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	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	76.81.66.052.1	450	76.81.66.552.1
840	76.81.66.054.1	840	76.81.66.554.1
1230	76.81.66.056.1	1230	76.81.66.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.402.1	230	76.83.37.121.1
813	76.80.60.404.1	255	76.83.37.122.1
1219	76.80.60.406.1	305	76.83.37.123.1
1524	76.80.60.408.1	355	76.83.37.125.1
1829	76.80.60.410.1	405	76.83.37.126.1
2134	76.80.60.412.1	455	76.83.37.127.1
2438	76.80.60.414.1		
2743	76.80.60.416.1		
3048	76.80.60.418.1		

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 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	* 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

BOLTSET WAFER CHECK VALVE

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	4	5/8	* 90	66.271.1	50	4	5/8	* 150	66.281.1
80	4	5/8	* 110	66.274.1	80	4	5/8	* 170	66.284.1
100	8	5/8	* 110	66.274.1	100	8	5/8	* 170	66.284.1
150	8	3/4	* 120	66.332.1	150	8	3/4	* 210	66.346.1
200	8	3/4	* 130	66.334.1	200	8	3/4	* 240	66.351.1
250	12	7/8	* 140	66.404.1	250	12	7/8	* 290	66.428.1
300	12	7/8	* 150	66.406.1	300	12	7/8	* 310	66.432.1
350	12	1	* 160	66.472.1	350	12	1	* 330	66.500.1
400	16	1	* 170	66.474.1	400	16	1	* 330	66.500.1
450	16	1 1/8	* 180	66.533.1	450	16	1 1/8	* 360	66.562.1
500	20	1 1/8	* 200	66.525.1	500	20	1 1/8	* 390	66.566.1
600	20	1 1/4	* 220	66.597.1	600	20	1 1/4	* 400	66.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.403.1	
WELDING NECK FLANGE	1	76.62.78.402.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
WELDING NECK FLANGE	1	76.62.78.404.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
WELDING NECK FLANGE	2	76.62.78.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.78.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.78.402.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.013.1	
WELDING NECK FLANGE	1	76.62.78.402.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	
WELDING NECK FLANGE	1	76.62.78.404.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	

CLASS 11441

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 19.6 19.2 18.4 17.6 16.9

NOTES

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- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	B	A	20 160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25 160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40 160
350	C	C	C	C	E	E	E	B	B	B	B	A					50 80
300	C	C	C	C	E	E	E	B	B	B	A						80 80
250	C	C	C	C	E	E	E	B	B	A							100 80
200	C	C	C	C	E	E	B	B	A								150 80
150	C	C	C	C	E	B	B	A									200 40
100	C	C	C	B	B	B	A										250 40
80	C	C	C	B	B	A											300 40
50	C	B	B	B	A												350 40
40	B	B	B	A													400 40
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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 11441	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 11441, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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,A105 TRIM: INCOLOY 825,PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

11441, REV.A 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	74.30.03	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	477.1	529.1	579.1	
* 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	364.1	366.1	318.1	320.1	322.1	324.1	326.1	268.1	270.1	274.1	
* 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	786.1	807.1	828.1	
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	786.1	807.1	828.1	
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	786.1	807.1	828.1	
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	786.1	807.1	828.1	
* VALVES																		
BALL VALVE FULL BORE FLANGED	77.00.53	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1									
BALL VALVE RED. BORE FLANGED	77.00.53	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1							
BALL VALVE FULL BORE TRUN FLGD	77.00.91									515.1	516.1							
BALL VALVE RED. BORE TRUN FLGD	77.00.91											517.1	518.1	519.1	520.1	521.1	523.1	
BUTTERFLY VALVE WAFER TYPE	77.57.70									014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED	77.10.43	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.57					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	77.30.53	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1								
MONOFL SINGLE BLOCK BALL	77.00.97	403.1	404.1	405.1	407.1	408.1												
* 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	76.64.96	052.1	054.1	056.1	058.1													
ORIFICE FLANGE SET	76.62.95					760.1	762.1	614.1	616.1	568.1	620.1	622.1	624.1	626.1	518.1	520.1	524.1	
STRAINER Y-TYPE	76.83.22					026.1	028.1	030.1	032.1	034.1	036.1	038.1	040.1	042.1				

	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	79.01.268.1			
80* 40		30.66.229.1	30.67.229.1	30.88.129.1	450* 80	79.01.280.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*100	79.01.292.1			
100* 40		30.66.253.1	30.67.253.1	30.88.147.1	450*150	79.01.303.1			
100* 50	79.01.362.1	30.66.267.1	30.67.267.1	30.88.154.1	450*200	79.00.414.1	30.66.510.1	30.67.510.1	30.88.589.1
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1	450*250	79.00.422.1	30.66.534.1	30.67.534.1	30.88.613.1
150* 50	79.01.364.1				450*300	79.00.429.1	30.66.564.1	30.67.564.1	30.88.637.1
150* 80	79.01.388.1	30.66.297.1	30.67.297.1	30.88.178.1	450*350	79.00.435.1	30.66.596.1	30.67.596.1	30.88.661.1
150*100	79.01.410.1	30.66.307.1	30.67.307.1	30.88.190.1	450*400	79.00.440.1	30.66.626.1	30.67.626.1	30.88.685.1
200* 50	79.01.066.1				500* 50	79.01.269.1			
200* 80	79.01.090.1				500* 80	79.01.281.1			
200*100	79.01.112.1	30.66.326.1	30.67.326.1	30.88.212.1	500*100	79.01.293.1			
200*150	79.01.132.1	30.66.336.1	30.67.336.1	30.88.232.1	500*150	79.01.304.1			
250* 50	79.01.068.1				500*200	79.00.415.1	29.47.910.1	29.62.910.1	30.88.709.1
250* 80	79.01.092.1				500*250	79.00.423.1	29.47.943.1	29.62.943.1	30.88.733.1
250*100	79.01.114.1	29.47.344.1	29.62.344.1	30.88.260.1	500*300	79.00.430.1	30.66.654.1	30.67.654.1	30.88.757.1
250*150	79.01.134.1	30.66.356.1	30.67.356.1	30.88.278.1	500*350	79.00.436.1	30.66.686.1	30.67.686.1	30.88.781.1
250*200	79.00.902.1	30.66.365.1	30.67.365.1	30.88.291.1	500*400	79.00.441.1	30.66.716.1	30.67.716.1	30.88.805.1
300* 50	79.01.070.1				500*450	79.00.528.1	30.66.732.1	30.67.732.1	30.88.819.1
300* 80	79.01.094.1				600* 50	79.01.271.1			
300*100	79.01.116.1				600* 80	79.01.283.1			
300*150	79.01.136.1	30.66.380.1	30.67.380.1	30.88.317.1	600*100	79.01.295.1			
300*200	79.00.904.1	30.66.396.1	30.67.396.1	30.88.328.1	600*150	79.01.306.1			
300*250	79.00.920.1	30.66.404.1	30.67.404.1	30.88.350.1	600*200	79.00.417.1			
350* 50	79.01.072.1				600*250	79.00.425.1	30.66.810.1	30.67.810.1	30.88.853.1
350* 80	79.01.096.1				600*300	79.00.432.1	30.66.830.1	30.67.830.1	30.88.877.1
350*100	79.01.118.1				600*350	79.00.438.1	30.66.850.1	30.67.850.1	30.88.901.1
350*150	79.01.138.1	29.47.604.1	29.62.604.1	30.88.379.1	600*400	79.00.443.1	30.66.897.1	30.67.897.1	30.88.925.1
350*200	79.00.906.1	30.66.422.1	30.67.422.1	30.88.390.1	600*450	79.00.532.1	30.66.912.1	30.67.912.1	30.88.939.1
350*250	79.00.922.1	30.66.438.1	30.67.438.1	30.88.415.1	600*500	79.00.538.1	30.66.942.1	30.67.942.1	30.88.963.1
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	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	76.81.66.052.1	450	76.81.66.552.1
840	76.81.66.054.1	840	76.81.66.554.1
1230	76.81.66.056.1	1230	76.81.66.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.402.1	230	76.83.37.121.1
813	76.80.60.404.1	255	76.83.37.122.1
1219	76.80.60.406.1	305	76.83.37.123.1
1524	76.80.60.408.1	355	76.83.37.125.1
1829	76.80.60.410.1	405	76.83.37.126.1
2134	76.80.60.412.1	455	76.83.37.127.1
2438	76.80.60.414.1		
2743	76.80.60.416.1		
3048	76.80.60.418.1		

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 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

BOLTSET WAFER CHECK VALVE

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	4	5/8	* 90	66.271.1	50	4	5/8	* 150	66.281.1
80	4	5/8	* 110	66.274.1	80	4	5/8	* 170	66.284.1
100	8	5/8	* 110	66.274.1	100	8	5/8	* 170	66.284.1
150	8	3/4	* 120	66.332.1	150	8	3/4	* 210	66.346.1
200	8	3/4	* 130	66.334.1	200	8	3/4	* 240	66.351.1
250	12	7/8	* 140	66.404.1	250	12	7/8	* 290	66.428.1
300	12	7/8	* 150	66.406.1	300	12	7/8	* 310	66.432.1
350	12	1	* 160	66.472.1	350	12	1	* 330	66.500.1
400	16	1	* 170	66.474.1	400	16	1	* 330	66.500.1
450	16	1 1/8	* 180	66.533.1	450	16	1 1/8	* 360	66.562.1
500	20	1 1/8	* 200	66.525.1	500	20	1 1/8	* 390	66.566.1
600	20	1 1/4	* 220	66.597.1	600	20	1 1/4	* 400	66.625.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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
MONOFL SINGLE BLOCK BALL 1 77.00.97.403.1
WELDING NECK FLANGE 1 76.62.78.402.1

* DRAIN POINT DN 20 FIG.DF 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
MONOFL SINGLE BLOCK BALL 1 77.00.97.404.1
WELDING NECK FLANGE 1 76.62.78.404.1

* DRAIN POINT DN 20 FIG.DE 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
MONOFL SINGLE BLOCK BALL 1 77.00.97.404.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.303.1
WELDING NECK FLANGE 2 76.62.78.402.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.303.1
WELDING NECK FLANGE 1 76.62.78.402.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.303.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.303.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.303.1
WELDING NECK FLANGE 1 76.62.78.402.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.303.1

* 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 76.83.37.121.1

* 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 76.83.37.122.1

* VENT POINT DN 15 FIG.DF 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.013.1
WELDING NECK FLANGE 1 76.62.78.402.1

* VENT POINT DN 20 FIG.DF 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.014.1
WELDING NECK FLANGE 1 76.62.78.404.1

* VENT POINT DN 20 FIG.DE 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.014.1

CLASS 11450

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	120	150	200
-----	-----						
	PRESSURE BAR GA						
DN15 -600	19.6	19.2	18.4	17.6	16.9	15.8	13.9

- 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.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

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 80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20 80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25 80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40 80
350	C	C	C	C	E	E	E	B	B	B	B	A					50 40
300	C	C	C	C	E	E	E	B	B	B	A						80 40
250	C	C	C	C	E	E	E	B	B	A							100 40
200	C	C	C	C	E	E	B	B	A								150 40
150	C	C	C	C	E	B	B	A									200 20
100	C	C	C	B	B	B	A										250 20
80	C	C	C	B	B	A											300 20
50	C	B	B	B	A												350 20
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 11450	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

API5	PIPE (API 5L-B)	DN 15-350	API 5L-B (SML)
		DN400-600	API 5L-B (WLD)
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- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	239.1	279.1	319.1	373.1				
	74.13.17													419.1	469.1	521.1	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
* 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												
	77.10.23					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	77.67.51					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												
	77.20.23					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												
	77.30.23					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	76.64.96	052.1	054.1	056.1	058.1												
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	76.83.37.121.1
813	76.80.60.044.1	255	76.83.37.122.1
1219	76.80.60.046.1	305	76.83.37.123.1
1524	76.80.60.048.1	355	76.83.37.125.1
1829	76.80.60.050.1	405	76.83.37.126.1
2134	76.80.60.052.1	455	76.83.37.127.1
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

BOLTSET WAFER CHECK VALVE

81.38				
DN	NR	INCH	*	MM
50	4	5/8	*	150
80	4	5/8	*	170
100	8	5/8	*	170
150	8	3/4	*	210
200	8	3/4	*	240
250	12	7/8	*	290
300	12	7/8	*	310
350	12	1	*	330
400	16	1	*	330
450	16	1 1/8	*	360
500	20	1 1/8	*	390
600	20	1 1/4	*	400

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 - 40
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.OI	DN 50 -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	
WELDING NECK FLANGE	1	76.62.78.352.1	

* 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	76.83.37.121.1	

* 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	76.83.37.122.1	

* 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 11460

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	120	150	200

	PRESSURE BAR GA						
DN15 -600	19.6	19.2	18.4	17.6	16.9	15.8	13.9

- 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.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

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 80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20 80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25 80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40 80
350	C	C	C	C	E	E	E	B	B	B	B	A					50 40
300	C	C	C	C	E	E	E	B	B	B	A						80 40
250	C	C	C	C	E	E	E	B	B	A							100 40
200	C	C	C	C	E	E	B	B	A								150 40
150	C	C	C	C	E	B	B	A									200 20
100	C	C	C	B	B	B	A										250 20
80	C	C	C	B	B	A											300 20
50	C	B	B	B	A												350 20
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 11460	CONSIGNEE :	
ANS RATING : CLASS 150	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 11460, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* 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- 40 BODY: ASTM A216-WCB/WCC,A105
DN 50-600 TRIM: AISI 316(L),STELLITE 6
CHWL DUAL PL. CHECK VALVE WAFER LUG DN 50-600 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316,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
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-B7M/A194-2HM
LEGT LEVEL GAUGE THROUGH VISION DN 20- 20 BODY: ASTM A105
BOLT: ASTM A193-B7M/A194-2HM
MTRR METER RUN DN 15- 40 MONEL 400
LJ END FLANGES: ASTM A350-LF2
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 MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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
* 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 FLANGED	77.10.05	003.1	004.1	005.1	007.1												
	77.10.23					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	77.67.51					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												
	77.20.23					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												
	77.30.23					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	76.64.96	052.1	054.1	056.1	058.1												
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.66.052.1	450	76.81.66.552.1
840	76.81.66.054.1	840	76.81.66.554.1
1230	76.81.66.056.1	1230	76.81.66.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.402.1	230	76.83.37.121.1
813	76.80.60.404.1	255	76.83.37.122.1
1219	76.80.60.406.1	305	76.83.37.123.1
1524	76.80.60.408.1	355	76.83.37.125.1
1829	76.80.60.410.1	405	76.83.37.126.1
2134	76.80.60.412.1	455	76.83.37.127.1
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

BOLTSET WAFER CHECK VALVE

81.38			
DN	NR	INCH	* MM
50	4	5/8	* 150
80	4	5/8	* 170
100	8	5/8	* 170
150	8	3/4	* 210
200	8	3/4	* 240
250	12	7/8	* 290
300	12	7/8	* 310
350	12	1	* 330
400	16	1	* 330
450	16	1 1/8	* 360
500	20	1 1/8	* 390
600	20	1 1/4	* 400

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	81.38.66.153.1	
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	81.38.66.155.1	
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	81.38.66.155.1	

* 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	81.38.66.153.1	
	8	81.38.66.155.1	
WELDING NECK FLANGE	2	76.62.78.352.1	

* PRESSURE INSTR.CONN.	DN 15	FIG.OI	DN 15 - 40
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.OI	DN 50 -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	
WELDING NECK FLANGE	1	76.62.78.352.1	

* 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	81.38.66.153.1	
	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	76.83.37.121.1	

* 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	76.83.37.122.1	

* 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	81.38.66.153.1	
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	81.38.66.155.1	
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	81.38.66.155.1	

CLASS 11470

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -600	18.2	18.2	18.0	17.5	17.0	16.5

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

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	80
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40
300	C	C	C	C	E	E	E	B	B	B	B						80	40
250	C	C	C	C	E	E	E	B	B	B	A						100	40
200	C	C	C	C	E	E	B	B	A								150	40
150	C	C	C	C	E	B	B	A									200	20
100	C	C	C	B	B	B	A										250	20
80	C	C	C	B	B	A											300	20
50	C	B	B	B	A												350	20
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP.	PLANT :	
CLASS NO. : 11470	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* 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
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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	

* 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 FULL BORE FLANGED	77.00.33	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1								
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							
BALL VALVE FULL BORE TRUN FLGD	77.00.82										516.1							
BALL VALVE RED. BORE TRUN FLGD	77.00.82											517.1	518.1	519.1	520.1	521.1	523.1	
BUTTERFLY VALVE WAFER TYPE	77.57.41								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1	
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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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								
MONOFL SINGLE BLOCK BALL	77.00.95	403.1	404.1	405.1	407.1	408.1												

* 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	76.64.96	052.1	054.1	056.1	058.1													
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	76.83.37.121.1
813	76.80.60.244.1	255	76.83.37.122.1
1219	76.80.60.246.1	305	76.83.37.123.1
1524	76.80.60.248.1	355	76.83.37.125.1
1829	76.80.60.250.1	405	76.83.37.126.1
2134	76.80.60.252.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
-----					-----				
					15	4	1/2	* 60	63.153.1
					20	4	1/2	* 70	63.155.1
					25	4	1/2	* 70	63.155.1
					40	4	1/2	* 80	63.157.1
					50	4	5/8	* 80	63.269.1
80	4	5/8	* 90	63.271.1	80	4	5/8	* 100	63.273.1
100	8	5/8	* 100	63.273.1	100	8	5/8	* 100	63.273.1
150	8	3/4	* 110	63.330.1	150	8	3/4	* 100	63.329.1
200	8	3/4	* 110	63.330.1	200	8	3/4	* 110	63.330.1
250	12	7/8	* 130	63.403.1	250	12	7/8	* 120	63.401.1
300	12	7/8	* 140	63.404.1	300	12	7/8	* 120	63.401.1
350	12	1	* 150	63.471.1	350	12	1	* 130	63.468.1
400	16	1	* 160	63.472.1	400	16	1	* 140	63.469.1
450	16	1 1/8	* 180	63.533.1	450	16	1 1/8	* 150	63.529.1
500	20	1 1/8	* 190	63.535.1	500	20	1 1/8	* 160	63.530.1
600	20	1 1/4	* 230	63.598.1	600	20	1 1/4	* 180	63.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
-----					-----				
15	4	1/2	* 70	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
					80	8	3/4	* 150	63.337.1
					100	12	3/4	* 140	63.335.1
					150	12	3/4	* 140	63.335.1
					200	12	7/8	* 150	63.406.1
					250	16	1	* 170	63.474.1
					300	16	1 1/8	* 190	63.535.1
					350	20	1 1/8	* 200	63.524.1
					400	20	1 1/4	* 210	63.595.1
					450	24	1 1/4	* 220	63.597.1
					500	24	1 1/4	* 230	63.598.1
					600	24	1 1/2	* 260	63.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
-----					-----				
15	4	1/2	* 70	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	4	5/8	* 90	63.271.1	50	4	5/8	* 150	63.281.1
80	4	5/8	* 110	63.274.1	80	4	5/8	* 170	63.284.1
100	8	5/8	* 110	63.274.1	100	8	5/8	* 170	63.284.1
150	8	3/4	* 120	63.332.1	150	8	3/4	* 210	63.346.1
200	8	3/4	* 130	63.334.1	200	8	3/4	* 240	63.351.1
250	12	7/8	* 140	63.404.1	250	12	7/8	* 290	63.428.1
300	12	7/8	* 150	63.406.1	300	12	7/8	* 310	63.432.1
350	12	1	* 160	63.472.1	350	12	1	* 330	63.500.1
400	16	1	* 170	63.474.1	400	16	1	* 330	63.500.1
450	16	1 1/8	* 180	63.533.1	450	16	1 1/8	* 360	63.562.1
500	20	1 1/8	* 200	63.524.1	500	20	1 1/8	* 390	63.566.1
600	20	1 1/4	* 220	63.597.1	600	20	1 1/4	* 400	63.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.403.1	
WELDING NECK FLANGE	1	76.62.82.152.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
WELDING NECK FLANGE	1	76.62.82.154.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
WELDING NECK FLANGE	2	76.62.82.152.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.82.152.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.82.152.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.013.1	
WELDING NECK FLANGE	1	76.62.82.152.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	
WELDING NECK FLANGE	1	76.62.82.154.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	

CLASS 11480

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -600	18.2	18.2	18.0	17.5	17.0	16.5

- 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.
COLD BENDING IS NOT ALLOWED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	80
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40
300	C	C	C	C	E	E	E	B	B	B	A						80	40
250	C	C	C	C	E	E	E	B	B	A							100	40
200	C	C	C	C	E	E	B	B	A								150	40
150	C	C	C	C	E	B	B	A									200	20
100	C	C	C	B	B	B	A										250	20
80	C	C	C	B	B	A											300	20
50	C	B	B	B	A												350	20
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 11480	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 11480, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	091.1	103.1	115.1	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	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																		
BALL VALVE FULL BORE FLANGED	77.00.33	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1								
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							
BALL VALVE FULL BORE TRUN FLGD	77.00.82										516.1	517.1	518.1	519.1	520.1	521.1	523.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.82											017.1	018.1	019.1	020.1	021.1	023.1	
BUTTERFLY VALVE WAFER TYPE	77.57.41								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1	
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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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								
MONOFL SINGLE BLOCK BALL	77.00.95	403.1	404.1	405.1	407.1	408.1												
* 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	76.64.96	052.1	054.1	056.1	058.1													
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
	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	79.04.278.1			
25* 15		31.66.147.1	31.75.147.1	31.88.045.1	400* 80	79.04.290.1			
25* 20		31.66.157.1	31.75.157.1	31.88.055.1	400*100	79.04.302.1			
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
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
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* 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
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
50* 40		31.66.206.1	31.75.206.1	31.88.118.1	450* 50	79.04.279.1			
80* 40		31.66.226.1	31.75.226.1	31.88.127.1	450* 80	79.04.291.1			
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* 40		31.66.250.1	31.75.250.1	31.88.145.1	450*150	79.04.313.1			
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
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					

		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	76.81.68.052.1	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	76.83.37.121.1
813	76.80.60.584.1	255	76.83.37.122.1
1219	76.80.60.586.1	305	76.83.37.123.1
1524	76.80.60.588.1	355	76.83.37.125.1
1829	76.80.60.590.1	405	76.83.37.126.1
2134	76.80.60.592.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 60	67.153.1
					20	4	1/2	* 70	67.155.1
					25	4	1/2	* 70	67.155.1
					40	4	1/2	* 80	67.157.1
					50	4	5/8	* 80	67.269.1
80	4	5/8	* 90	67.271.1	80	4	5/8	* 100	67.273.1
100	8	5/8	* 100	67.273.1	100	8	5/8	* 100	67.273.1
150	8	3/4	* 110	67.330.1	150	8	3/4	* 100	67.329.1
200	8	3/4	* 110	67.330.1	200	8	3/4	* 110	67.330.1
250	12	7/8	* 130	67.403.1	250	12	7/8	* 120	67.401.1
300	12	7/8	* 140	67.404.1	300	12	7/8	* 120	67.401.1
350	12	1	* 150	67.471.1	350	12	1	* 130	67.468.1
400	16	1	* 160	67.472.1	400	16	1	* 140	67.469.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 150	67.529.1
500	20	1 1/8	* 190	67.535.1	500	20	1 1/8	* 160	67.530.1
600	20	1 1/4	* 230	67.598.1	600	20	1 1/4	* 180	67.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
50	4	5/8	* 90	67.271.1	50	4	5/8	* 150	67.281.1
80	4	5/8	* 110	67.274.1	80	4	5/8	* 170	67.284.1
100	8	5/8	* 110	67.274.1	100	8	5/8	* 170	67.284.1
150	8	3/4	* 120	67.332.1	150	8	3/4	* 210	67.346.1
200	8	3/4	* 130	67.334.1	200	8	3/4	* 240	67.351.1
250	12	7/8	* 140	67.404.1	250	12	7/8	* 290	67.429.1
300	12	7/8	* 150	67.406.1	300	12	7/8	* 310	67.432.1
350	12	1	* 160	67.472.1	350	12	1	* 330	67.500.1
400	16	1	* 170	67.474.1	400	16	1	* 330	67.500.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 360	67.562.1
500	20	1 1/8	* 200	67.544.1	500	20	1 1/8	* 390	67.566.1
600	20	1 1/4	* 220	67.597.1	600	20	1 1/4	* 400	67.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.403.1	
WELDING NECK FLANGE	1	76.62.82.152.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
WELDING NECK FLANGE	1	76.62.82.154.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
WELDING NECK FLANGE	2	76.62.82.152.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.82.152.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.82.152.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.013.1	
WELDING NECK FLANGE	1	76.62.82.152.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	
WELDING NECK FLANGE	1	76.62.82.154.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	

CLASS 11490

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-50	0	50	75	100	120	
PRESSURE BAR GA						
DN15 -600	18.2	18.2	18.0	17.5	17.0	16.5

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
- 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
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	160
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	80
300	C	C	C	C	E	E	E	B	B	B	A						80	80
250	C	C	C	C	E	E	E	B	B	A							100	80
200	C	C	C	C	E	E	B	B	A								150	80
150	C	C	C	C	E	B	B	A									200	40
100	C	C	C	B	B	B	A										250	40
80	C	C	C	B	B	A											300	40
50	C	B	B	B	A												350	40
40	B	B	B	A													400	40
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
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP.	PLANT :	
CLASS NO. : 11490	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 11490, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A352+ENP,A350+ENP TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A352+ENP,A350+ENP TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	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	166.1	206.1	237.1	
* 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	182.1	184.1	186.1	188.1	160.1	162.1	164.1	166.1	118.1	120.1	122.1	124.1	126.1	068.1	070.1	074.1	
* 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	348.1	368.1	385.1	395.1	405.1	
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	348.1	368.1	385.1	395.1	405.1	
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	348.1	368.1	385.1	395.1	405.1	
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	348.1	368.1	385.1	395.1	405.1	
* VALVES																		
BALL VALVE FULL BORE FLANGED	77.00.33	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1								
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							
BALL VALVE FULL BORE TRUN FLGD	77.00.83										516.1							
BALL VALVE RED. BORE TRUN FLGD	77.00.83											517.1	518.1	519.1	520.1	521.1	523.1	
BUTTERFLY VALVE WAFER TYPE	77.57.41								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1	
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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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								
MONOFL SINGLE BLOCK BALL	77.00.95	403.1	404.1	405.1	407.1	408.1												
* 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	76.64.96	052.1	054.1	056.1	058.1													
ORIFICE FLANGE SET	76.62.97					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	518.1	520.1	524.1	
STRAINER Y-TYPE	76.83.19					526.1	528.1	530.1	532.1	534.1	536.1	538.1	540.1	542.1				

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		31.70.141.1	31.71.141.1	31.85.039.1	400* 50	79.05.074.1			
25* 15		31.70.151.1	31.71.151.1	31.85.049.1	400* 80	79.05.098.1			
25* 20		31.70.161.1	31.71.161.1	31.85.059.1	400*100	79.05.120.1			
40* 15		31.70.171.1	31.71.171.1	31.85.069.1	400*150	79.05.140.1	29.44.754.1	29.59.754.1	31.85.469.1
40* 20		31.70.181.1	31.71.181.1	31.85.079.1	400*200	79.04.908.1	31.70.453.1	31.71.453.1	31.85.479.1
40* 25		31.70.191.1	31.71.191.1	31.85.089.1	400*250	79.04.924.1	31.70.462.1	31.71.462.1	31.85.505.1
50* 20		29.44.193.1	29.59.193.1	31.85.102.1	400*300	79.04.938.1	31.70.474.1	31.71.474.1	31.85.531.1
50* 25		31.70.199.1	31.71.199.1	31.85.111.1	400*350	79.04.950.1	31.70.487.1	31.71.487.1	31.85.556.1
50* 40		31.70.208.1	31.71.208.1	31.85.120.1	450* 50	79.05.268.1			
80* 40		31.70.229.1	31.71.229.1	31.85.129.1	450* 80	79.05.280.1			
80* 50	79.05.360.1	31.70.237.1	31.71.237.1	31.85.133.1	450*100	79.05.292.1			
100* 40		31.70.253.1	31.71.253.1	31.85.147.1	450*150	79.05.303.1			
100* 50	79.05.362.1	31.70.267.1	31.71.267.1	31.85.154.1	450*200		31.70.510.1	31.71.510.1	31.85.589.1
100* 80	79.05.386.1	31.70.277.1	31.71.277.1	31.85.166.1	450*250		31.70.534.1	31.71.534.1	31.85.613.1
150* 50	79.05.364.1				450*300		31.70.564.1	31.71.564.1	31.85.637.1
150* 80	79.05.388.1	31.70.297.1	31.71.297.1	31.85.178.1	450*350		31.70.596.1	31.71.596.1	31.85.661.1
150*100	79.05.410.1	31.70.307.1	31.71.307.1	31.85.190.1	450*400		31.70.626.1	31.71.626.1	31.85.685.1
200* 50	79.05.066.1				500* 50	79.05.269.1			
200* 80	79.05.090.1				500* 80	79.05.281.1			
200*100	79.05.112.1	31.70.326.1	31.71.326.1	31.85.212.1	500*100	79.05.293.1			
200*150	79.05.132.1	31.70.336.1	31.71.336.1	31.85.232.1	500*150	79.05.304.1			
250* 50	79.05.068.1				500*200		29.44.910.1	29.59.910.1	31.85.709.1
250* 80	79.05.092.1				500*250		29.44.943.1	29.59.943.1	31.85.733.1
250*100	79.05.114.1	31.70.344.1	31.71.344.1	31.85.261.1	500*300		31.70.654.1	31.71.654.1	31.85.757.1
250*150	79.05.134.1	31.70.356.1	31.71.356.1	31.85.278.1	500*350		31.70.686.1	31.71.686.1	31.85.781.1
250*200	79.04.902.1	31.70.365.1	31.71.365.1	31.85.291.1	500*400		31.70.716.1	31.71.716.1	31.85.805.1
300* 50	79.05.070.1				500*450	79.04.528.1	31.70.732.1	31.71.732.1	31.85.819.1
300* 80	79.05.094.1				600* 50	79.05.271.1			
300*100	79.05.116.1				600* 80	79.05.283.1			
300*150	79.05.136.1	31.70.384.1	31.71.384.1	31.85.317.1	600*100	79.05.295.1			
300*200	79.04.904.1	31.70.396.1	31.71.396.1	31.85.328.1	600*150	79.05.306.1			
300*250	79.04.920.1	31.70.404.1	31.71.404.1	31.85.350.1	600*200	79.04.417.1			
350* 50	79.05.072.1				600*250	79.04.427.1	31.70.810.1	31.71.810.1	31.85.853.1
350* 80	79.05.096.1				600*300		31.70.830.1	31.71.830.1	31.85.877.1
350*100	79.05.118.1				600*350		31.70.850.1	31.71.850.1	31.85.901.1
350*150	79.05.138.1	31.70.414.1	31.71.414.1	31.85.379.1	600*400		31.70.896.1	31.71.896.1	31.85.925.1
350*200	79.04.906.1	31.70.422.1	31.71.422.1	31.85.390.1	600*450	79.04.532.1	31.70.912.1	31.71.912.1	31.85.939.1
350*250	79.04.922.1	31.70.438.1	31.71.438.1	31.85.415.1	600*500	79.04.538.1	31.70.942.1	31.71.942.1	31.85.963.1
350*300	79.04.936.1	31.70.447.1	31.71.447.1	31.85.441.1					

		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	76.81.67.052.1	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	76.83.37.121.1
813	76.80.60.244.1	255	76.83.37.122.1
1219	76.80.60.246.1	305	76.83.37.123.1
1524	76.80.60.248.1	355	76.83.37.125.1
1829	76.80.60.250.1	405	76.83.37.126.1
2134	76.80.60.252.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 60	63.153.1
					20	4	1/2	* 70	63.155.1
					25	4	1/2	* 70	63.155.1
					40	4	1/2	* 80	63.157.1
					50	4	5/8	* 80	63.269.1
80	4	5/8	* 90	63.271.1	80	4	5/8	* 100	63.273.1
100	8	5/8	* 100	63.273.1	100	8	5/8	* 100	63.273.1
150	8	3/4	* 110	63.330.1	150	8	3/4	* 100	63.329.1
200	8	3/4	* 110	63.330.1	200	8	3/4	* 110	63.330.1
250	12	7/8	* 130	63.403.1	250	12	7/8	* 120	63.401.1
300	12	7/8	* 140	63.404.1	300	12	7/8	* 120	63.401.1
350	12	1	* 150	63.471.1	350	12	1	* 130	63.468.1
400	16	1	* 160	63.472.1	400	16	1	* 140	63.469.1
450	16	1 1/8	* 180	63.533.1	450	16	1 1/8	* 150	63.529.1
500	20	1 1/8	* 190	63.535.1	500	20	1 1/8	* 160	63.530.1
600	20	1 1/4	* 230	63.598.1	600	20	1 1/4	* 180	63.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	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
					80	8	3/4	* 150	63.337.1
					100	12	3/4	* 140	63.335.1
					150	12	3/4	* 140	63.335.1
					200	12	7/8	* 150	63.406.1
					250	16	1	* 170	63.474.1
					300	16	1 1/8	* 190	63.535.1
					350	20	1 1/8	* 200	63.524.1
					400	20	1 1/4	* 210	63.595.1
					450	24	1 1/4	* 220	63.597.1
					500	24	1 1/4	* 230	63.598.1
					600	24	1 1/2	* 260	63.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 70	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	4	5/8	* 90	63.271.1	50	4	5/8	* 150	63.281.1
80	4	5/8	* 110	63.274.1	80	4	5/8	* 170	63.284.1
100	8	5/8	* 110	63.274.1	100	8	5/8	* 170	63.284.1
150	8	3/4	* 120	63.332.1	150	8	3/4	* 210	63.346.1
200	8	3/4	* 130	63.334.1	200	8	3/4	* 240	63.351.1
250	12	7/8	* 140	63.404.1	250	12	7/8	* 290	63.428.1
300	12	7/8	* 150	63.406.1	300	12	7/8	* 310	63.432.1
350	12	1	* 160	63.472.1	350	12	1	* 330	63.500.1
400	16	1	* 170	63.474.1	400	16	1	* 330	63.500.1
450	16	1 1/8	* 180	63.533.1	450	16	1 1/8	* 360	63.562.1
500	20	1 1/8	* 200	63.524.1	500	20	1 1/8	* 390	63.566.1
600	20	1 1/4	* 220	63.597.1	600	20	1 1/4	* 400	63.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.403.1	
WELDING NECK FLANGE	1	76.62.82.182.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
WELDING NECK FLANGE	1	76.62.82.184.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
WELDING NECK FLANGE	2	76.62.82.182.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.82.182.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.82.182.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.013.1	
WELDING NECK FLANGE	1	76.62.82.182.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	
WELDING NECK FLANGE	1	76.62.82.184.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	

CLASS 11500

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -600	18.2	18.2	18.0	17.5	17.0	16.5

- 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.
COLD BENDING IS NOT ALLOWED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	B	A	20 160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25 160
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40 160
350	C	C	C	C	E	E	E	B	B	B	B	A					50 80
300	C	C	C	C	E	E	E	B	B	B	A						80 80
250	C	C	C	C	E	E	E	B	B	A							100 80
200	C	C	C	C	E	E	B	B	A								150 80
150	C	C	C	C	E	B	B	A									200 40
100	C	C	C	B	B	B	A										250 40
80	C	C	C	B	B	A											300 40
50	C	B	B	B	A												350 40
40	B	B	B	A													400 40
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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 11500	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 11500, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A352+ENP,A350+ENP TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A352+ENP,A350+ENP TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

11500, 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	74.30.16	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	166.1	206.1	236.1	
* 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	164.1	166.1	118.1	120.1	122.1	124.1	126.1	068.1	070.1	074.1	
* 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	385.1	395.1	405.1	
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	385.1	395.1	405.1	
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	385.1	395.1	405.1	
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	385.1	395.1	405.1	
* VALVES																		
BALL VALVE FULL BORE FLANGED	77.00.33	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1								
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							
BALL VALVE FULL BORE TRUN FLGD	77.00.83										516.1	517.1	518.1	519.1	520.1	521.1	523.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.83											017.1	018.1	019.1	020.1	021.1	023.1	
BUTTERFLY VALVE WAFER TYPE	77.57.41								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1	
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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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								
MONOFL SINGLE BLOCK BALL	77.00.95	403.1	404.1	405.1	407.1	408.1												
* 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	76.64.96	052.1	054.1	056.1	058.1													
ORIFICE FLANGE SET	76.62.97					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	518.1	520.1	524.1	
STRAINER Y-TYPE	76.83.22					526.1	528.1	530.1	532.1	534.1	536.1	538.1	540.1	542.1				

	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	79.05.268.1			
80* 40		31.66.229.1	31.75.229.1	31.88.129.1	450* 80	79.05.280.1			
80* 50	79.05.360.1	31.66.237.1	31.75.237.1	31.88.133.1	450*100	79.05.292.1			
100* 40		31.66.253.1	31.75.253.1	31.88.147.1	450*150	79.05.303.1			
100* 50	79.05.362.1	31.66.267.1	31.75.267.1	31.88.154.1	450*200		31.66.510.1	31.75.510.1	31.88.589.1
100* 80	79.05.386.1	31.66.277.1	31.75.277.1	31.88.166.1	450*250		31.66.534.1	31.75.534.1	31.88.613.1
150* 50	79.05.364.1				450*300		31.66.564.1	31.75.564.1	31.88.637.1
150* 80	79.05.388.1	31.66.297.1	31.75.297.1	31.88.178.1	450*350		31.66.596.1	31.75.596.1	31.88.661.1
150*100	79.05.410.1	31.66.307.1	31.75.307.1	31.88.190.1	450*400		31.66.626.1	31.75.626.1	31.88.685.1
200* 50	79.05.066.1				500* 50	79.05.269.1			
200* 80	79.05.090.1				500* 80	79.05.281.1			
200*100	79.05.112.1	31.66.326.1	31.75.326.1	31.88.212.1	500*100	79.05.293.1			
200*150	79.05.132.1	31.66.336.1	31.75.336.1	31.88.232.1	500*150	79.05.304.1			
250* 50	79.05.068.1				500*200		29.45.910.1	29.60.910.1	31.88.709.1
250* 80	79.05.092.1				500*250		29.45.943.1	29.60.943.1	31.88.733.1
250*100	79.05.114.1	31.66.344.1	31.75.344.1	31.88.261.1	500*300		31.66.654.1	31.75.654.1	31.88.757.1
250*150	79.05.134.1	31.66.356.1	31.75.356.1	31.88.278.1	500*350		31.66.686.1	31.75.686.1	31.88.781.1
250*200	79.04.902.1	31.66.365.1	31.75.365.1	31.88.291.1	500*400		31.66.716.1	31.75.716.1	31.88.805.1
300* 50	79.05.070.1				500*450	79.04.528.1	31.66.732.1	31.75.732.1	31.88.819.1
300* 80	79.05.094.1				600* 50	79.05.271.1			
300*100	79.05.116.1				600* 80	79.05.283.1			
300*150	79.05.136.1	31.66.384.1	31.75.384.1	31.88.317.1	600*100	79.05.295.1			
300*200	79.04.904.1	31.66.396.1	31.75.396.1	31.88.328.1	600*150	79.05.306.1			
300*250	79.04.920.1	31.66.404.1	31.75.404.1	31.88.350.1	600*200	79.04.417.1			
350* 50	79.05.072.1				600*250	79.04.427.1	31.66.810.1	31.75.810.1	31.88.853.1
350* 80	79.05.096.1				600*300		31.66.830.1	31.75.830.1	31.88.877.1
350*100	79.05.118.1				600*350		31.66.850.1	31.75.850.1	31.88.901.1
350*150	79.05.138.1	31.66.414.1	31.75.414.1	31.88.379.1	600*400		31.66.896.1	31.75.896.1	31.88.925.1
350*200	79.04.906.1	31.66.422.1	31.75.422.1	31.88.390.1	600*450	79.04.532.1	31.66.912.1	31.75.912.1	31.88.939.1
350*250	79.04.922.1	31.66.438.1	31.75.438.1	31.88.415.1	600*500	79.04.538.1	31.66.942.1	31.75.942.1	31.88.963.1
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	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	76.83.37.121.1
813	76.80.60.584.1	255	76.83.37.122.1
1219	76.80.60.586.1	305	76.83.37.123.1
1524	76.80.60.588.1	355	76.83.37.125.1
1829	76.80.60.590.1	405	76.83.37.126.1
2134	76.80.60.592.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 60	67.153.1
					20	4	1/2	* 70	67.155.1
					25	4	1/2	* 70	67.155.1
					40	4	1/2	* 80	67.157.1
					50	4	5/8	* 80	67.269.1
80	4	5/8	* 90	67.271.1	80	4	5/8	* 100	67.273.1
100	8	5/8	* 100	67.273.1	100	8	5/8	* 100	67.273.1
150	8	3/4	* 110	67.330.1	150	8	3/4	* 100	67.329.1
200	8	3/4	* 110	67.330.1	200	8	3/4	* 110	67.330.1
250	12	7/8	* 130	67.403.1	250	12	7/8	* 120	67.401.1
300	12	7/8	* 140	67.404.1	300	12	7/8	* 120	67.401.1
350	12	1	* 150	67.471.1	350	12	1	* 130	67.468.1
400	16	1	* 160	67.472.1	400	16	1	* 140	67.469.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 150	67.529.1
500	20	1 1/8	* 190	67.535.1	500	20	1 1/8	* 160	67.530.1
600	20	1 1/4	* 230	67.598.1	600	20	1 1/4	* 180	67.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
50	4	5/8	* 90	67.271.1	50	4	5/8	* 150	67.281.1
80	4	5/8	* 110	67.274.1	80	4	5/8	* 170	67.284.1
100	8	5/8	* 110	67.274.1	100	8	5/8	* 170	67.284.1
150	8	3/4	* 120	67.332.1	150	8	3/4	* 210	67.346.1
200	8	3/4	* 130	67.334.1	200	8	3/4	* 240	67.351.1
250	12	7/8	* 140	67.404.1	250	12	7/8	* 290	67.429.1
300	12	7/8	* 150	67.406.1	300	12	7/8	* 310	67.432.1
350	12	1	* 160	67.472.1	350	12	1	* 330	67.500.1
400	16	1	* 170	67.474.1	400	16	1	* 330	67.500.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 360	67.562.1
500	20	1 1/8	* 200	67.544.1	500	20	1 1/8	* 390	67.566.1
600	20	1 1/4	* 220	67.597.1	600	20	1 1/4	* 400	67.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.403.1	
WELDING NECK FLANGE	1	76.62.82.182.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
WELDING NECK FLANGE	1	76.62.82.184.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
WELDING NECK FLANGE	2	76.62.82.182.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.82.182.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.003.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
WELDING NECK FLANGE	1	76.62.82.182.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.003.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.013.1	
WELDING NECK FLANGE	1	76.62.82.182.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	
WELDING NECK FLANGE	1	76.62.82.184.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.014.1	

CLASS 11501

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-50	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	18.2	18.2	18.0	17.5	17.0	16.5

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	160
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	80
300	C	C	C	C	E	E	E	B	B	B	A						80	80
250	C	C	C	C	E	E	E	B	B	A							100	80
200	C	C	C	C	E	E	B	B	A								150	80
150	C	C	C	C	E	B	B	A									200	40
100	C	C	C	B	B	B	A										250	40
80	C	C	C	B	B	A											300	40
50	C	B	B	B	A												350	40
40	B	B	B	A													400	40
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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 11501	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* 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
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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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	MONEL 400 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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	166.1	206.1	236.1	
* 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	164.1	166.1	118.1	120.1	122.1	124.1	126.1	068.1	070.1	074.1	
* 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	385.1	395.1	405.1	
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	385.1	395.1	405.1	
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	385.1	395.1	405.1	
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	385.1	395.1	405.1	
* VALVES																		
BALL VALVE FULL BORE FLANGED	77.00.57	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1								
BALL VALVE RED. BORE FLANGED	77.00.57	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1							
BALL VALVE FULL BORE TRUN FLGD	77.00.93										516.1		517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.00.93												017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.57.71								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1	
CHECK VALVE FLANGED	77.10.44	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.58					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	77.30.54	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1								
MONOFL SINGLE BLOCK BALL	77.00.97	403.1	404.1	405.1	407.1	408.1												
* 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	76.64.96	052.1	054.1	056.1	058.1													
ORIFICE FLANGE SET	76.62.97					760.1	762.1	614.1	616.1	568.1	570.1	572.1	574.1	576.1	518.1	520.1	524.1	
STRAINER Y-TYPE	76.83.22					526.1	528.1	530.1	532.1	534.1	536.1	538.1	540.1	542.1				

	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	79.05.268.1			
80* 40		31.66.229.1	31.75.229.1	31.88.129.1	450* 80	79.05.280.1			
80* 50	79.05.360.1	31.66.237.1	31.75.237.1	31.88.133.1	450*100	79.05.292.1			
100* 40		31.66.253.1	31.75.253.1	31.88.147.1	450*150	79.05.303.1			
100* 50	79.05.362.1	31.66.267.1	31.75.267.1	31.88.154.1	450*200		31.66.510.1	31.75.510.1	31.88.589.1
100* 80	79.05.386.1	31.66.277.1	31.75.277.1	31.88.166.1	450*250		31.66.534.1	31.75.534.1	31.88.613.1
150* 50	79.05.364.1				450*300		31.66.564.1	31.75.564.1	31.88.637.1
150* 80	79.05.388.1	31.66.297.1	31.75.297.1	31.88.178.1	450*350		31.66.596.1	31.75.596.1	31.88.661.1
150*100	79.05.410.1	31.66.307.1	31.75.307.1	31.88.190.1	450*400		31.66.626.1	31.75.626.1	31.88.685.1
200* 50	79.05.066.1				500* 50	79.05.269.1			
200* 80	79.05.090.1				500* 80	79.05.281.1			
200*100	79.05.112.1	31.66.326.1	31.75.326.1	31.88.212.1	500*100	79.05.293.1			
200*150	79.05.132.1	31.66.336.1	31.75.336.1	31.88.232.1	500*150	79.05.304.1			
250* 50	79.05.068.1				500*200		29.45.910.1	29.60.910.1	31.88.709.1
250* 80	79.05.092.1				500*250		29.45.943.1	29.60.943.1	31.88.733.1
250*100	79.05.114.1	31.66.344.1	31.75.344.1	31.88.261.1	500*300		31.66.654.1	31.75.654.1	31.88.757.1
250*150	79.05.134.1	31.66.356.1	31.75.356.1	31.88.278.1	500*350		31.66.686.1	31.75.686.1	31.88.781.1
250*200	79.04.902.1	31.66.365.1	31.75.365.1	31.88.291.1	500*400		31.66.716.1	31.75.716.1	31.88.805.1
300* 50	79.05.070.1				500*450	79.04.528.1	31.66.732.1	31.75.732.1	31.88.819.1
300* 80	79.05.094.1				600* 50	79.05.271.1			
300*100	79.05.116.1				600* 80	79.05.283.1			
300*150	79.05.136.1	31.66.384.1	31.75.384.1	31.88.317.1	600*100	79.05.295.1			
300*200	79.04.904.1	31.66.396.1	31.75.396.1	31.88.328.1	600*150	79.05.306.1			
300*250	79.04.920.1	31.66.404.1	31.75.404.1	31.88.350.1	600*200	79.04.417.1			
350* 50	79.05.072.1				600*250	79.04.427.1	31.66.810.1	31.75.810.1	31.88.853.1
350* 80	79.05.096.1				600*300		31.66.830.1	31.75.830.1	31.88.877.1
350*100	79.05.118.1				600*350		31.66.850.1	31.75.850.1	31.88.901.1
350*150	79.05.138.1	31.66.414.1	31.75.414.1	31.88.379.1	600*400		31.66.896.1	31.75.896.1	31.88.925.1
350*200	79.04.906.1	31.66.422.1	31.75.422.1	31.88.390.1	600*450	79.04.532.1	31.66.912.1	31.75.912.1	31.88.939.1
350*250	79.04.922.1	31.66.438.1	31.75.438.1	31.88.415.1	600*500	79.04.538.1	31.66.942.1	31.75.942.1	31.88.963.1
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	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	76.83.37.121.1
813	76.80.60.584.1	255	76.83.37.122.1
1219	76.80.60.586.1	305	76.83.37.123.1
1524	76.80.60.588.1	355	76.83.37.125.1
1829	76.80.60.590.1	405	76.83.37.126.1
2134	76.80.60.592.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 60	67.153.1
					20	4	1/2	* 70	67.155.1
					25	4	1/2	* 70	67.155.1
					40	4	1/2	* 80	67.157.1
					50	4	5/8	* 80	67.269.1
80	4	5/8	* 90	67.271.1	80	4	5/8	* 100	67.273.1
100	8	5/8	* 100	67.273.1	100	8	5/8	* 100	67.273.1
150	8	3/4	* 110	67.330.1	150	8	3/4	* 100	67.329.1
200	8	3/4	* 110	67.330.1	200	8	3/4	* 110	67.330.1
250	12	7/8	* 130	67.403.1	250	12	7/8	* 120	67.401.1
300	12	7/8	* 140	67.404.1	300	12	7/8	* 120	67.401.1
350	12	1	* 150	67.471.1	350	12	1	* 130	67.468.1
400	16	1	* 160	67.472.1	400	16	1	* 140	67.469.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 150	67.529.1
500	20	1 1/8	* 190	67.535.1	500	20	1 1/8	* 160	67.530.1
600	20	1 1/4	* 230	67.598.1	600	20	1 1/4	* 180	67.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
50	4	5/8	* 90	67.271.1	50	4	5/8	* 150	67.281.1
80	4	5/8	* 110	67.274.1	80	4	5/8	* 170	67.284.1
100	8	5/8	* 110	67.274.1	100	8	5/8	* 170	67.284.1
150	8	3/4	* 120	67.332.1	150	8	3/4	* 210	67.346.1
200	8	3/4	* 130	67.334.1	200	8	3/4	* 240	67.351.1
250	12	7/8	* 140	67.404.1	250	12	7/8	* 290	67.429.1
300	12	7/8	* 150	67.406.1	300	12	7/8	* 310	67.432.1
350	12	1	* 160	67.472.1	350	12	1	* 330	67.500.1
400	16	1	* 170	67.474.1	400	16	1	* 330	67.500.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 360	67.562.1
500	20	1 1/8	* 200	67.544.1	500	20	1 1/8	* 390	67.566.1
600	20	1 1/4	* 220	67.597.1	600	20	1 1/4	* 400	67.625.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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
MONOFL SINGLE BLOCK BALL 1 77.00.97.403.1
WELDING NECK FLANGE 1 76.62.82.182.1

* DRAIN POINT DN 20 FIG.DF 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
MONOFL SINGLE BLOCK BALL 1 77.00.97.404.1
WELDING NECK FLANGE 1 76.62.82.184.1

* DRAIN POINT DN 20 FIG.DE 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
MONOFL SINGLE BLOCK BALL 1 77.00.97.404.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.303.1
WELDING NECK FLANGE 2 76.62.82.182.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.303.1
WELDING NECK FLANGE 1 76.62.82.182.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.303.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 2 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.303.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.303.1
WELDING NECK FLANGE 1 76.62.82.182.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, RF TANGED INSERT 1 85.30.01.004.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.303.1

* 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 76.83.37.121.1

* 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 76.83.37.122.1

* VENT POINT DN 15 FIG.DF 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.013.1
WELDING NECK FLANGE 1 76.62.82.182.1

* VENT POINT DN 20 FIG.DF 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.014.1
WELDING NECK FLANGE 1 76.62.82.184.1

* VENT POINT DN 20 FIG.DE 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
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.014.1

CLASS 13410

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 0 50 75 100 120

PRESSURE BAR GA

DN15 -600 18.9 18.9 18.3 17.1 16.0 15.5

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
- FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- FOR BENDING OF PIPE SEE 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.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	E	B	B	A						100	10S
200	C	C	C	C	E	E	B	B	A								150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	C	B	B	B	A									250	10S
80	C	C	C	B	B	B	A										300	10S
50	C	B	B	B	B	A											350	10S
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINLESS STEEL AISI 316	PLANT	:	
CLASS NO. : 13410	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
		DN350-600	ASTM A358-316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-400	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-400	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),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	74.36.33	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
* 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 FULL BORE FLANGED	77.03.03	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1							
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						
BALL VALVE FULL BORE TRUN FLGD	77.03.74										516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.58.40								014.1	015.1	016.1	017.1	018.1	019.1			
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			
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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							
MONOFL SINGLE BLOCK BALL	77.03.90	103.1	104.1	105.1	107.1	108.1											
* 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	76.64.96	052.1	054.1	056.1	058.1												
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 76.83.37.121.1
813 76.80.61.444.1	255 76.83.37.122.1
1219 76.80.61.446.1	305 76.83.37.123.1
1524 76.80.61.448.1	355 76.83.37.125.1
1829 76.80.61.450.1	405 76.83.37.126.1
2134 76.80.61.452.1	455 76.83.37.127.1
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 API609 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	* 80	61.269.1
80	4	5/8	* 90	61.271.1	80	4	5/8	* 100	61.273.1
100	8	5/8	* 100	61.273.1	100	8	5/8	* 100	61.273.1
150	8	3/4	* 110	61.330.1	150	8	3/4	* 100	61.329.1
200	8	3/4	* 110	61.330.1	200	8	3/4	* 110	61.330.1
250	12	7/8	* 130	61.403.1	250	12	7/8	* 120	61.401.1
300	12	7/8	* 140	61.404.1	300	12	7/8	* 120	61.401.1
350	12	1	* 150	61.471.1	350	12	1	* 130	61.468.1
400	16	1	* 160	61.472.1	400	16	1	* 140	61.469.1
450	16	1 1/8	* 180	61.533.1	450	16	1 1/8	* 150	61.529.1
500	20	1 1/8	* 190	61.535.1	500	20	1 1/8	* 160	61.530.1
600	20	1 1/4	* 230	61.598.1	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.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.103.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.104.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.104.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.503.1	
WELDING NECK FLANGE	2	76.65.79.262.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.503.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.013.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.014.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.014.1	

CLASS 13420

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-20	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	18.9	18.9	18.3	17.1	16.0	15.5

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	E	B	B	A						100	10S
200	C	C	C	C	E	E	E	B	B	A							150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	C	B	B	A										250	10S
80	C	C	C	B	B	A											300	10S
50	C	B	B	B	A												350	10S
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINLESS STEEL AISI 316, SOUR	PLANT :	
CLASS NO. : 13420	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
		DN350-600	ASTM A358-316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-400	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-400	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),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F316
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	74.36.33	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
* 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 FULL BORE FLANGED	77.03.03	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1							
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						
BALL VALVE FULL BORE TRUN FLGD	77.03.74										516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.58.40								014.1	015.1	016.1	017.1	018.1	019.1			
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			
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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							
MONOFL SINGLE BLOCK BALL	77.03.90	103.1	104.1	105.1	107.1	108.1											
* 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	76.64.96	052.1	054.1	056.1	058.1												
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	76.81.71.052.1	450	76.81.71.552.1
840	76.81.71.054.1	840	76.81.71.554.1
1230	76.81.71.056.1	1230	76.81.71.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.442.1	230	76.83.37.121.1
813	76.80.61.444.1	255	76.83.37.122.1
1219	76.80.61.446.1	305	76.83.37.123.1
1524	76.80.61.448.1	355	76.83.37.125.1
1829	76.80.61.450.1	405	76.83.37.126.1
2134	76.80.61.452.1	455	76.83.37.127.1
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 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	* 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

BOLTSET WAFER CHECK VALVE

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	4	5/8	* 90	66.271.1	50	4	5/8	* 150	66.281.1
80	4	5/8	* 110	66.274.1	80	4	5/8	* 170	66.284.1
100	8	5/8	* 110	66.274.1	100	8	5/8	* 170	66.284.1
150	8	3/4	* 120	66.332.1	150	8	3/4	* 210	66.346.1
200	8	3/4	* 130	66.334.1	200	8	3/4	* 240	66.351.1
250	12	7/8	* 140	66.404.1	250	12	7/8	* 290	66.428.1
300	12	7/8	* 150	66.406.1	300	12	7/8	* 310	66.432.1
350	12	1	* 160	66.472.1	350	12	1	* 330	66.500.1
400	16	1	* 170	66.474.1	400	16	1	* 330	66.500.1
450	16	1 1/8	* 180	66.533.1	450	16	1 1/8	* 360	66.562.1
500	20	1 1/8	* 200	66.525.1	500	20	1 1/8	* 390	66.566.1
600	20	1 1/4	* 220	66.597.1	600	20	1 1/4	* 400	66.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.103.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.104.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.104.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.503.1	
WELDING NECK FLANGE	2	76.65.79.262.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.503.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.013.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.014.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.014.1	

CLASS 13430

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	-20	0	50	75	100	120	150	200

	PRESSURE BAR GA							
DN15 -600	18.9	18.9	18.3	17.1	16.0	15.5	14.7	13.5

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

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	B	B	B	B	B	A	15	40S
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	40S
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	E	B	B	A						100	10S
200	C	C	C	C	E	E	B	B	A								150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	B	B	B	A										250	10S
80	C	C	C	B	B	A											300	10S
50	C	B	B	B	A												350	10S
40	B	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
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 13430	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 13430, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
		DN350-600	ASTM A358-316L

* 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

CHVF	CHECK VALVE FLANGED	DN 15-400	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),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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	74.36.33	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
* 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			
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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	76.64.96	052.1	054.1	056.1	058.1												
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	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	

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	4	5/8	* 150	61.281.1
80	4	5/8	* 170	61.284.1
100	8	5/8	* 170	61.284.1
150	8	3/4	* 210	61.346.1
200	8	3/4	* 240	61.351.1
250	12	7/8	* 290	61.428.1
300	12	7/8	* 310	61.432.1
350	12	1	* 330	61.500.1
400	16	1	* 330	61.500.1
450	16	1 1/8	* 360	61.562.1
500	20	1 1/8	* 390	61.566.1
600	20	1 1/4	* 400	61.625.1

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    76.65.10.312.1
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.0H 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 INTR.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  77.23.03.003.1
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 - 40
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.OI  DN 50 -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
WELDING NECK FLANGE           1  76.65.79.262.1

```

```

* 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  77.23.03.003.1
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 76.83.37.121.1

```

```

* 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  76.83.37.122.1

```

```

* VENT POINT                      DN 15  FIG.11  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.11	DN 40 - 40
Branch:N (:N=br.tab,:S=BNI,F,: =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 13450

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-100 0 50 75 100 120

PRESSURE BAR GA

DN15 -600 18.9 18.9 18.3 17.1 16.0 15.5

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
- FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- FOR BENDING OF PIPE SEE 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
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	E	B	B	A						100	10S
200	C	C	C	C	E	E	B	B	A								150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	C	B	B	B	A									250	10S
80	C	C	C	B	B	B	A										300	10S
50	C	B	B	B	B	A											350	10S
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINLESS STEEL LOW TEMP.	PLANT	:	
CLASS NO. : 13450	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 13450, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	DN350-600	ASTM A358-316L
		---	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
BTFF	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-350	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-400	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),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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 A320-L7/A194-4
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A320-L7/A194-4
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F316
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	74.36.33	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
* 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 FULL BORE FLANGED	77.03.07	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1							
BALL VALVE RED. BORE FLANGED	77.03.07	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
BALL VALVE FULL BORE TRUN FLGD	77.03.73										516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.58.41								014.1	015.1	016.1	017.1	018.1				
CHECK VALVE FLANGED	77.13.19	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			
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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	77.33.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.03.90	003.1	004.1	005.1	007.1	008.1											
* 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	76.64.96	002.1	004.1	006.1	008.1												
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			

RUN* BR	BROB				RECB				REEB				TERB			
	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.
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												

BRANCH	RUN-PIPE	BNIF		BNIP	
		76.80.39	76.80.31	76.80.39	76.80.31
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	76.81.72.052.1	450	76.81.72.552.1
840	76.81.72.054.1	840	76.81.72.554.1
1230	76.81.72.056.1	1230	76.81.72.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.442.1	230	76.83.37.121.1
813	76.80.61.444.1	255	76.83.37.122.1
1219	76.80.61.446.1	305	76.83.37.123.1
1524	76.80.61.448.1	355	76.83.37.125.1
1829	76.80.61.450.1	405	76.83.37.126.1
2134	76.80.61.452.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 60	63.153.1
					20	4	1/2	* 70	63.155.1
					25	4	1/2	* 70	63.155.1
					40	4	1/2	* 80	63.157.1
					50	4	5/8	* 80	63.269.1
80	4	5/8	* 90	63.271.1	80	4	5/8	* 100	63.273.1
100	8	5/8	* 100	63.273.1	100	8	5/8	* 100	63.273.1
150	8	3/4	* 110	63.330.1	150	8	3/4	* 100	63.329.1
200	8	3/4	* 110	63.330.1	200	8	3/4	* 110	63.330.1
250	12	7/8	* 130	63.403.1	250	12	7/8	* 120	63.401.1
300	12	7/8	* 140	63.404.1	300	12	7/8	* 120	63.401.1
350	12	1	* 150	63.471.1	350	12	1	* 130	63.468.1
400	16	1	* 160	63.472.1	400	16	1	* 140	63.469.1
450	16	1 1/8	* 180	63.533.1	450	16	1 1/8	* 150	63.529.1
500	20	1 1/8	* 190	63.535.1	500	20	1 1/8	* 160	63.530.1
600	20	1 1/4	* 230	63.598.1	600	20	1 1/4	* 180	63.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	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
					80	8	3/4	* 150	63.337.1
					100	12	3/4	* 140	63.335.1
					150	12	3/4	* 140	63.335.1
					200	12	7/8	* 150	63.406.1
					250	16	1	* 170	63.474.1
					300	16	1 1/8	* 190	63.535.1
					350	20	1 1/8	* 200	63.524.1
					400	20	1 1/4	* 210	63.595.1
					450	24	1 1/4	* 220	63.597.1
					500	24	1 1/4	* 230	63.598.1
					600	24	1 1/2	* 260	63.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 70	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	4	5/8	* 90	63.271.1	50	4	5/8	* 150	63.281.1
80	4	5/8	* 110	63.274.1	80	4	5/8	* 170	63.284.1
100	8	5/8	* 110	63.274.1	100	8	5/8	* 170	63.284.1
150	8	3/4	* 120	63.332.1	150	8	3/4	* 210	63.346.1
200	8	3/4	* 130	63.334.1	200	8	3/4	* 240	63.351.1
250	12	7/8	* 140	63.404.1	250	12	7/8	* 290	63.428.1
300	12	7/8	* 150	63.406.1	300	12	7/8	* 310	63.432.1
350	12	1	* 160	63.472.1	350	12	1	* 330	63.500.1
400	16	1	* 170	63.474.1	400	16	1	* 330	63.500.1
450	16	1 1/8	* 180	63.533.1	450	16	1 1/8	* 360	63.562.1
500	20	1 1/8	* 200	63.524.1	500	20	1 1/8	* 390	63.566.1
600	20	1 1/4	* 220	63.597.1	600	20	1 1/4	* 400	63.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.003.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.004.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.004.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.403.1	
WELDING NECK FLANGE	2	76.65.79.262.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.403.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.403.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.403.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.403.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.403.1	
* 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	76.65.60.781.1	
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	76.83.37.121.1	
* 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	76.65.60.781.1	
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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.92.013.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.92.014.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.92.014.1	

CLASS 13460

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-73	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -600	18.9	18.9	18.3	17.1	16.0	15.5

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	E	B	B	A						100	10S
200	C	C	C	C	E	E	B	B	A								150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	C	B	B	B	A									250	10S
80	C	C	C	B	B	B	A										300	10S
50	C	B	B	B	B	A											350	10S
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

STAINLESS STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 13460	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	DN350-600	ASTM A358-316L
		---	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),PTFE
BTFF	BALL VALVE FULL BORE TRUN FLGD	DN250-600	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-350	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-400	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),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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 A320-L7M/A194-7M
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F316
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	74.36.33	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
* 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 FULL BORE FLANGED	77.03.07	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1	565.1							
BALL VALVE RED. BORE FLANGED	77.03.07	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
BALL VALVE FULL BORE TRUN FLGD	77.03.73										516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.58.41								014.1	015.1	016.1	017.1	018.1				
CHECK VALVE FLANGED	77.13.19	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			
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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	77.33.05	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.03.90	103.1	104.1	105.1	107.1	108.1											
* 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	76.64.96	002.1	004.1	006.1	008.1												
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			

RUN* BR	BROB				RECB				REEB				TERB			
	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.
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												

BRANCH	RUN-PIPE	BNIF		BNIP	
		76.80.39	76.80.31	76.80.39	76.80.31
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	76.81.73.052.1	450	76.81.73.552.1
840	76.81.73.054.1	840	76.81.73.554.1
1230	76.81.73.056.1	1230	76.81.73.556.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.442.1	230	76.83.37.121.1
813	76.80.61.444.1	255	76.83.37.122.1
1219	76.80.61.446.1	305	76.83.37.123.1
1524	76.80.61.448.1	355	76.83.37.125.1
1829	76.80.61.450.1	405	76.83.37.126.1
2134	76.80.61.452.1	455	76.83.37.127.1
2438	76.80.61.454.1		
2743	76.80.61.456.1		
3048	76.80.61.458.1		

COMP.	DESCRIPTION
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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	67.153.1
					20	4	1/2	* 70	67.155.1
					25	4	1/2	* 70	67.155.1
					40	4	1/2	* 80	67.157.1
					50	4	5/8	* 80	67.269.1
80	4	5/8	* 90	67.271.1	80	4	5/8	* 100	67.273.1
100	8	5/8	* 100	67.273.1	100	8	5/8	* 100	67.273.1
150	8	3/4	* 110	67.330.1	150	8	3/4	* 100	67.329.1
200	8	3/4	* 110	67.330.1	200	8	3/4	* 110	67.330.1
250	12	7/8	* 130	67.403.1	250	12	7/8	* 120	67.401.1
300	12	7/8	* 140	67.404.1	300	12	7/8	* 120	67.401.1
350	12	1	* 150	67.471.1	350	12	1	* 130	67.468.1
400	16	1	* 160	67.472.1	400	16	1	* 140	67.469.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 150	67.529.1
500	20	1 1/8	* 190	67.535.1	500	20	1 1/8	* 160	67.530.1
600	20	1 1/4	* 230	67.598.1	600	20	1 1/4	* 180	67.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
50	4	5/8	* 90	67.271.1	50	4	5/8	* 150	67.281.1
80	4	5/8	* 110	67.274.1	80	4	5/8	* 170	67.284.1
100	8	5/8	* 110	67.274.1	100	8	5/8	* 170	67.284.1
150	8	3/4	* 120	67.332.1	150	8	3/4	* 210	67.346.1
200	8	3/4	* 130	67.334.1	200	8	3/4	* 240	67.351.1
250	12	7/8	* 140	67.404.1	250	12	7/8	* 290	67.429.1
300	12	7/8	* 150	67.406.1	300	12	7/8	* 310	67.432.1
350	12	1	* 160	67.472.1	350	12	1	* 330	67.500.1
400	16	1	* 170	67.474.1	400	16	1	* 330	67.500.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 360	67.562.1
500	20	1 1/8	* 200	67.544.1	500	20	1 1/8	* 390	67.566.1
600	20	1 1/4	* 220	67.597.1	600	20	1 1/4	* 400	67.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.103.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.104.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.104.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.503.1	
WELDING NECK FLANGE	2	76.65.79.262.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.503.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.503.1	
* 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	76.65.60.781.1	
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	76.83.37.121.1	
* 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	76.65.60.781.1	
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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.013.1	
WELDING NECK FLANGE	1	76.65.79.262.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.014.1	
WELDING NECK FLANGE	1	76.65.79.264.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.014.1	

CLASS 13831

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-20	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	19.9	19.9	19.5	18.6	17.6	16.9

NOTES

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- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST
 - WHERE TWO OPTIONS ARE GIVEN FOR PIPE, 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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	E	B	B	A						100	10S
200	C	C	C	C	E	E	B	B	A								150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	C	B	B	B	A									250	10S
80	C	C	C	B	B	B	A										300	10S
50	C	B	B	B	B	A											350	10S
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803	PLANT :	
CLASS NO. : 13831	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 13831, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD	PIPE (WELDED)	DN150-600	ASTM A928-CL1 UNS S31803
PIPE	PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL	SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
		DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
		DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB	BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
		DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
		DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BAFF	BALL VALVE FULL BORE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BARF	BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BTFF	BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB	STRAINER Y-TYPE	DN 50-400	SIEVE: ASTM A240 UNS S31803
TWSG	THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57								143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
PIPE	74.36.58	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1								
* FLANGES																	
BLIND FLANGE	76.66.01	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
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	252.1	254.1	256.1	258.1	260.1	262.1	264.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1
WELDING NECK FLANGE	76.66.29	034.1	036.1	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
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
* VALVES																	
BALL VALVE FULL BORE FLANGED	77.03.41	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1								
BALL VALVE RED. BORE FLANGED	77.03.41	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
BALL VALVE FULL BORE TRUN FLGD	77.03.81									515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.58.09								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED	77.13.41	003.1	004.1	005.1	007.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.33.41	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.03.92	403.1	404.1	405.1	407.1	408.1											
* 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	622.1	624.1	626.1	628.1												
ORIFICE FLANGE SET	76.66.90					586.1	588.1	506.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	522.1	524.1
STRAINER Y-TYPE	76.83.21					802.1	804.1	806.1	808.1	810.1	812.1	814.1	816.1	818.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.48.374.1			
25* 15		36.43.025.1	36.58.025.1	36.83.025.1	400* 80	78.48.398.1			
25* 20		36.43.041.1	36.58.041.1	36.83.041.1	400*100	78.48.420.1			
40* 15		36.43.057.1	36.58.057.1	36.83.057.1	400*150	78.48.440.1			
40* 20		36.43.075.1	36.58.075.1	36.83.075.1	400*200		36.43.631.1	36.58.631.1	36.83.631.1
40* 25		36.43.086.1	36.58.086.1	36.83.086.1	400*250		36.43.648.1	36.58.648.1	36.83.648.1
50* 20		36.43.107.1	36.58.107.1	36.83.107.1	400*300		36.43.665.1	36.58.665.1	36.83.665.1
50* 25		36.43.120.1	36.58.120.1	36.83.120.1	400*350		36.43.682.1	36.58.682.1	36.83.682.1
50* 40		36.43.136.1	36.58.136.1	36.83.136.1	450* 50	78.48.376.1			
80* 40		36.43.152.1	36.58.152.1	36.83.152.1	450* 80	78.48.400.1			
80* 50		36.43.170.1	36.58.170.1	36.83.170.1	450*100	78.48.422.1			
100* 40		36.43.186.1	36.58.186.1	36.83.186.1	450*150	78.48.442.1			
100* 50		36.43.205.1	36.58.205.1	36.83.205.1	450*200			36.83.699.1	
100* 80		36.43.224.1	36.58.224.1	36.83.224.1	450*250		36.43.714.1	36.58.714.1	36.83.714.1
150* 50	78.48.364.1				450*300		36.43.731.1	36.58.731.1	36.83.731.1
150* 80		36.43.243.1	36.58.243.1	36.83.243.1	450*350		36.43.748.1	36.58.748.1	36.83.748.1
150*100		36.43.260.1	36.58.260.1	36.83.260.1	450*400		36.43.765.1	36.58.765.1	36.83.765.1
200* 50	78.48.366.1				500* 50	78.48.378.1			
200* 80	78.48.390.1				500* 80	78.48.402.1			
200*100		36.43.280.1	36.58.280.1	36.83.280.1	500*100	78.48.424.1			
200*150		36.43.304.1	36.58.304.1	36.83.304.1	500*150	78.48.444.1			
250* 50	78.48.368.1				500*200	78.48.462.1			
250* 80	78.48.392.1				500*250			36.83.799.1	
250*100	78.48.414.1				500*300		36.43.816.1	36.58.816.1	36.83.816.1
250*150		36.43.351.1	36.58.351.1	36.83.351.1	500*350		36.43.833.1	36.58.833.1	36.83.833.1
250*200		36.43.374.1	36.58.374.1	36.83.374.1	500*400		36.43.850.1	36.58.850.1	36.83.850.1
300* 50	78.48.370.1				500*450		36.43.867.1	36.58.867.1	36.83.867.1
300* 80	78.48.394.1				600* 50	78.48.382.1			
300*100	78.48.416.1				600* 80	78.48.406.1			
300*150		36.43.409.1	36.58.409.1	36.83.409.1	600*100	78.48.428.1			
300*200		36.43.436.1	36.58.436.1	36.83.436.1	600*150	78.48.448.1			
300*250		36.43.470.1	36.58.470.1	36.83.470.1	600*200	78.48.466.1			
350* 50	78.48.372.1				600*250	78.48.482.1			
350* 80	78.48.396.1				600*300			36.83.901.1	
350*100	78.48.418.1				600*350			36.83.921.1	
350*150		36.43.504.1	36.58.504.1	36.83.504.1	600*400		36.43.941.1	36.58.941.1	36.83.941.1
350*200		36.43.530.1	36.58.530.1	36.83.530.1	600*450		36.43.961.1	36.58.961.1	36.83.961.1
350*250		36.43.563.1	36.58.563.1	36.83.563.1	600*500		36.43.981.1	36.58.981.1	36.83.981.1
350*300		36.43.596.1	36.58.596.1	36.83.596.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
15	40-150	201.1	241.1
	200-600	202.1	242.1
20	40- 80	203.1	243.1
	100-600	204.1	244.1
25	40- 40	225.1	255.1
	50- 50	226.1	256.1
	80-100	227.1	257.1
	150-600	228.1	258.1
40	50- 50	230.1	259.1
	80- 80	231.1	260.1
	100-100	232.1	261.1
	150-300	233.1	262.1
	350-600	234.1	263.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450	76.81.73.002.1
840	76.81.73.004.1
1230	76.81.73.006.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356	76.80.62.402.1
813	76.80.62.404.1
1219	76.80.62.406.1
1524	76.80.62.408.1
1829	76.80.62.410.1
2134	76.80.62.412.1
2438	76.80.62.414.1
2743	76.80.62.416.1
3048	76.80.62.418.1

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 API609 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	* 80	61.269.1
80	4	5/8	* 90	61.271.1	80	4	5/8	* 100	61.273.1
100	8	5/8	* 100	61.273.1	100	8	5/8	* 100	61.273.1
150	8	3/4	* 110	61.330.1	150	8	3/4	* 100	61.329.1
200	8	3/4	* 110	61.330.1	200	8	3/4	* 110	61.330.1
250	12	7/8	* 130	61.403.1	250	12	7/8	* 120	61.401.1
300	12	7/8	* 140	61.404.1	300	12	7/8	* 120	61.401.1
350	12	1	* 150	61.471.1	350	12	1	* 130	61.468.1
400	16	1	* 160	61.472.1	400	16	1	* 140	61.469.1
450	16	1 1/8	* 180	61.533.1	450	16	1 1/8	* 150	61.529.1
500	20	1 1/8	* 190	61.535.1	500	20	1 1/8	* 160	61.530.1
600	20	1 1/4	* 230	61.598.1	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.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.002.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.403.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.404.1	
WELDING NECK FLANGE	1	76.66.29.036.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.803.1	
WELDING NECK FLANGE	2	76.66.29.034.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.803.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
* 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	76.65.61.012.1	
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	76.83.36.251.1	
* 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	76.65.61.012.1	
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	76.83.36.252.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.002.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.013.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.014.1	
WELDING NECK FLANGE	1	76.66.29.036.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.014.1	

CLASS 13832

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-20	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	19.9	19.9	19.5	18.6	17.6	16.9

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - WHERE TWO OPTIONS ARE GIVEN FOR PIPE, 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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	B	B	B	B	A					50	10S
300	C	C	C	C	E	E	E	B	B	B	A						80	10S
250	C	C	C	C	E	E	E	B	B	A							100	10S
200	C	C	C	C	E	E	B	B	A								150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	B	B	B	A										250	10S
80	C	C	C	B	B	A											300	10S
50	C	B	B	B	A												350	10S
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, SOUR	PLANT :	
CLASS NO. : 13832	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 13832, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN150-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BAFF BALL VALVE FULL BORE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BARF BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BTFB BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,STELLITE 6
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKTI GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB STRAINER Y-TYPE	DN 50-400	SIEVE: ASTM A240 UNS S31803
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57								143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
PIPE	74.36.58	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1								
* FLANGES																	
BLIND FLANGE	76.66.01	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
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	252.1	254.1	256.1	258.1	260.1	262.1	264.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1
WELDING NECK FLANGE	76.66.29	034.1	036.1	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
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
* VALVES																	
BALL VALVE FULL BORE FLANGED	77.03.41	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1								
BALL VALVE RED. BORE FLANGED	77.03.41	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
BALL VALVE FULL BORE TRUN FLGD	77.03.81									515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.58.09								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED	77.13.41	003.1	004.1	005.1	007.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.33.41	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.03.92	403.1	404.1	405.1	407.1	408.1											
* 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	622.1	624.1	626.1	628.1												
ORIFICE FLANGE SET	76.66.90					586.1	588.1	506.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	522.1	524.1
STRAINER Y-TYPE	76.83.21					802.1	804.1	806.1	808.1	810.1	812.1	814.1	816.1	818.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.48.374.1			
25* 15		36.43.025.1	36.58.025.1	36.83.025.1	400* 80	78.48.398.1			
25* 20		36.43.041.1	36.58.041.1	36.83.041.1	400*100	78.48.420.1			
40* 15		36.43.057.1	36.58.057.1	36.83.057.1	400*150	78.48.440.1			
40* 20		36.43.075.1	36.58.075.1	36.83.075.1	400*200		36.43.631.1	36.58.631.1	36.83.631.1
40* 25		36.43.086.1	36.58.086.1	36.83.086.1	400*250		36.43.648.1	36.58.648.1	36.83.648.1
50* 20		36.43.107.1	36.58.107.1	36.83.107.1	400*300		36.43.665.1	36.58.665.1	36.83.665.1
50* 25		36.43.120.1	36.58.120.1	36.83.120.1	400*350		36.43.682.1	36.58.682.1	36.83.682.1
50* 40		36.43.136.1	36.58.136.1	36.83.136.1	450* 50	78.48.376.1			
80* 40		36.43.152.1	36.58.152.1	36.83.152.1	450* 80	78.48.400.1			
80* 50		36.43.170.1	36.58.170.1	36.83.170.1	450*100	78.48.422.1			
100* 40		36.43.186.1	36.58.186.1	36.83.186.1	450*150	78.48.442.1			
100* 50		36.43.205.1	36.58.205.1	36.83.205.1	450*200			36.83.699.1	
100* 80		36.43.224.1	36.58.224.1	36.83.224.1	450*250		36.43.714.1	36.58.714.1	36.83.714.1
150* 50	78.48.364.1				450*300		36.43.731.1	36.58.731.1	36.83.731.1
150* 80		36.43.243.1	36.58.243.1	36.83.243.1	450*350		36.43.748.1	36.58.748.1	36.83.748.1
150*100		36.43.260.1	36.58.260.1	36.83.260.1	450*400		36.43.765.1	36.58.765.1	36.83.765.1
200* 50	78.48.366.1				500* 50	78.48.378.1			
200* 80	78.48.390.1				500* 80	78.48.402.1			
200*100		36.43.280.1	36.58.280.1	36.83.280.1	500*100	78.48.424.1			
200*150		36.43.304.1	36.58.304.1	36.83.304.1	500*150	78.48.444.1			
250* 50	78.48.368.1				500*200	78.48.462.1			
250* 80	78.48.392.1				500*250			36.83.799.1	
250*100	78.48.414.1				500*300		36.43.816.1	36.58.816.1	36.83.816.1
250*150		36.43.351.1	36.58.351.1	36.83.351.1	500*350		36.43.833.1	36.58.833.1	36.83.833.1
250*200		36.43.374.1	36.58.374.1	36.83.374.1	500*400		36.43.850.1	36.58.850.1	36.83.850.1
300* 50	78.48.370.1				500*450		36.43.867.1	36.58.867.1	36.83.867.1
300* 80	78.48.394.1				600* 50	78.48.382.1			
300*100	78.48.416.1				600* 80	78.48.406.1			
300*150		36.43.409.1	36.58.409.1	36.83.409.1	600*100	78.48.428.1			
300*200		36.43.436.1	36.58.436.1	36.83.436.1	600*150	78.48.448.1			
300*250		36.43.470.1	36.58.470.1	36.83.470.1	600*200	78.48.466.1			
350* 50	78.48.372.1				600*250	78.48.482.1			
350* 80	78.48.396.1				600*300			36.83.901.1	
350*100	78.48.418.1				600*350			36.83.921.1	
350*150		36.43.504.1	36.58.504.1	36.83.504.1	600*400		36.43.941.1	36.58.941.1	36.83.941.1
350*200		36.43.530.1	36.58.530.1	36.83.530.1	600*450		36.43.961.1	36.58.961.1	36.83.961.1
350*250		36.43.563.1	36.58.563.1	36.83.563.1	600*500		36.43.981.1	36.58.981.1	36.83.981.1
350*300		36.43.596.1	36.58.596.1	36.83.596.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
15	40-150	201.1	241.1
	200-600	202.1	242.1
20	40- 80	203.1	243.1
	100-600	204.1	244.1
25	40- 40	225.1	255.1
	50- 50	226.1	256.1
	80-100	227.1	257.1
	150-600	228.1	258.1
40	50- 50	230.1	259.1
	80- 80	231.1	260.1
	100-100	232.1	261.1
	150-300	233.1	262.1
	350-600	234.1	263.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450	76.81.73.002.1
840	76.81.73.004.1
1230	76.81.73.006.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356	76.80.62.402.1
813	76.80.62.404.1
1219	76.80.62.406.1
1524	76.80.62.408.1
1829	76.80.62.410.1
2134	76.80.62.412.1
2438	76.80.62.414.1
2743	76.80.62.416.1
3048	76.80.62.418.1

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 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

BOLTSET WAFER CHECK VALVE

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	4	5/8	* 90	66.271.1	50	4	5/8	* 150	66.281.1
80	4	5/8	* 110	66.274.1	80	4	5/8	* 170	66.284.1
100	8	5/8	* 110	66.274.1	100	8	5/8	* 170	66.284.1
150	8	3/4	* 120	66.332.1	150	8	3/4	* 210	66.346.1
200	8	3/4	* 130	66.334.1	200	8	3/4	* 240	66.351.1
250	12	7/8	* 140	66.404.1	250	12	7/8	* 290	66.428.1
300	12	7/8	* 150	66.406.1	300	12	7/8	* 310	66.432.1
350	12	1	* 160	66.472.1	350	12	1	* 330	66.500.1
400	16	1	* 170	66.474.1	400	16	1	* 330	66.500.1
450	16	1 1/8	* 180	66.533.1	450	16	1 1/8	* 360	66.562.1
500	20	1 1/8	* 200	66.525.1	500	20	1 1/8	* 390	66.566.1
600	20	1 1/4	* 220	66.597.1	600	20	1 1/4	* 400	66.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.002.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.403.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.404.1	
WELDING NECK FLANGE	1	76.66.29.036.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.803.1	
WELDING NECK FLANGE	2	76.66.29.034.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.803.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
* 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	76.65.61.012.1	
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	76.83.36.251.1	
* 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	76.65.61.012.1	
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	76.83.36.252.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.002.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.013.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.014.1	
WELDING NECK FLANGE	1	76.66.29.036.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.014.1	

CLASS 13833

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-50	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	19.9	19.9	19.5	18.6	17.6	16.9

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST
 - WHERE TWO OPTIONS ARE GIVEN FOR PIPE, 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	B	B	B	B	B	A	15	40S
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	A		20	40S
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	B	B	B	B	A					50	10S
300	C	C	C	C	E	E	E	B	B	B	A						80	10S
250	C	C	C	C	E	E	E	B	B	A							100	10S
200	C	C	C	C	E	E	B	B	A								150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	B	B	B	A										250	10S
80	C	C	C	B	B	A											300	10S
50	C	B	B	B	A												350	10S
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, LOW TEMP	PLANT :	
CLASS NO. : 13833	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 13833, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN150-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BAFF BALL VALVE FULL BORE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BARF BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BTFB BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,STELLITE 6
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNf MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKTI GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
STYB STRAINER Y-TYPE	DN 50-400	SIEVE: ASTM A240 UNS S31803
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57								143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
PIPE	74.36.58	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1								
* FLANGES																	
BLIND FLANGE	76.66.01	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
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	252.1	254.1	256.1	258.1	260.1	262.1	264.1	266.1	268.1	270.1	272.1	274.1	276.1	278.1	280.1	282.1
WELDING NECK FLANGE	76.66.29	034.1	036.1	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
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	182.1	198.1	213.1	231.1	246.1	261.1
* VALVES																	
BALL VALVE FULL BORE FLANGED	77.03.41	553.1	554.1	555.1	557.1	558.1	560.1	562.1	564.1								
BALL VALVE RED. BORE FLANGED	77.03.41	003.1	004.1	005.1	007.1	008.1	010.1	012.1	064.1	065.1	066.1						
BALL VALVE FULL BORE TRUN FLGD	77.03.81									515.1	516.1	517.1	518.1	519.1	520.1	521.1	523.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81											017.1	018.1	019.1	020.1	021.1	023.1
BUTTERFLY VALVE WAFER TYPE	77.58.09								014.1	015.1	016.1	017.1	018.1	019.1	020.1	021.1	023.1
CHECK VALVE FLANGED	77.13.41	003.1	004.1	005.1	007.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.33.41	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1	015.1							
MONOFL SINGLE BLOCK BALL	77.03.92	403.1	404.1	405.1	407.1	408.1											
* 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	622.1	624.1	626.1	628.1												
ORIFICE FLANGE SET	76.66.90					586.1	588.1	506.1	508.1	510.1	512.1	514.1	516.1	518.1	520.1	522.1	524.1
STRAINER Y-TYPE	76.83.21					802.1	804.1	806.1	808.1	810.1	812.1	814.1	816.1	818.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.48.374.1			
25* 15		36.43.025.1	36.58.025.1	36.83.025.1	400* 80	78.48.398.1			
25* 20		36.43.041.1	36.58.041.1	36.83.041.1	400*100	78.48.420.1			
40* 15		36.43.057.1	36.58.057.1	36.83.057.1	400*150	78.48.440.1			
40* 20		36.43.075.1	36.58.075.1	36.83.075.1	400*200		36.43.631.1	36.58.631.1	36.83.631.1
40* 25		36.43.086.1	36.58.086.1	36.83.086.1	400*250		36.43.648.1	36.58.648.1	36.83.648.1
50* 20		36.43.107.1	36.58.107.1	36.83.107.1	400*300		36.43.665.1	36.58.665.1	36.83.665.1
50* 25		36.43.120.1	36.58.120.1	36.83.120.1	400*350		36.43.682.1	36.58.682.1	36.83.682.1
50* 40		36.43.136.1	36.58.136.1	36.83.136.1	450* 50	78.48.376.1			
80* 40		36.43.152.1	36.58.152.1	36.83.152.1	450* 80	78.48.400.1			
80* 50		36.43.170.1	36.58.170.1	36.83.170.1	450*100	78.48.422.1			
100* 40		36.43.186.1	36.58.186.1	36.83.186.1	450*150	78.48.442.1			
100* 50		36.43.205.1	36.58.205.1	36.83.205.1	450*200			36.83.699.1	
100* 80		36.43.224.1	36.58.224.1	36.83.224.1	450*250		36.43.714.1	36.58.714.1	36.83.714.1
150* 50	78.48.364.1				450*300		36.43.731.1	36.58.731.1	36.83.731.1
150* 80		36.43.243.1	36.58.243.1	36.83.243.1	450*350		36.43.748.1	36.58.748.1	36.83.748.1
150*100		36.43.260.1	36.58.260.1	36.83.260.1	450*400		36.43.765.1	36.58.765.1	36.83.765.1
200* 50	78.48.366.1				500* 50	78.48.378.1			
200* 80	78.48.390.1				500* 80	78.48.402.1			
200*100		36.43.280.1	36.58.280.1	36.83.280.1	500*100	78.48.424.1			
200*150		36.43.304.1	36.58.304.1	36.83.304.1	500*150	78.48.444.1			
250* 50	78.48.368.1				500*200	78.48.462.1			
250* 80	78.48.392.1				500*250			36.83.799.1	
250*100	78.48.414.1				500*300		36.43.816.1	36.58.816.1	36.83.816.1
250*150		36.43.351.1	36.58.351.1	36.83.351.1	500*350		36.43.833.1	36.58.833.1	36.83.833.1
250*200		36.43.374.1	36.58.374.1	36.83.374.1	500*400		36.43.850.1	36.58.850.1	36.83.850.1
300* 50	78.48.370.1				500*450		36.43.867.1	36.58.867.1	36.83.867.1
300* 80	78.48.394.1				600* 50	78.48.382.1			
300*100	78.48.416.1				600* 80	78.48.406.1			
300*150		36.43.409.1	36.58.409.1	36.83.409.1	600*100	78.48.428.1			
300*200		36.43.436.1	36.58.436.1	36.83.436.1	600*150	78.48.448.1			
300*250		36.43.470.1	36.58.470.1	36.83.470.1	600*200	78.48.466.1			
350* 50	78.48.372.1				600*250	78.48.482.1			
350* 80	78.48.396.1				600*300			36.83.901.1	
350*100	78.48.418.1				600*350			36.83.921.1	
350*150		36.43.504.1	36.58.504.1	36.83.504.1	600*400		36.43.941.1	36.58.941.1	36.83.941.1
350*200		36.43.530.1	36.58.530.1	36.83.530.1	600*450		36.43.961.1	36.58.961.1	36.83.961.1
350*250		36.43.563.1	36.58.563.1	36.83.563.1	600*500		36.43.981.1	36.58.981.1	36.83.981.1
350*300		36.43.596.1	36.58.596.1	36.83.596.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
15	40-150	201.1	241.1
	200-600	202.1	242.1
20	40- 80	203.1	243.1
	100-600	204.1	244.1
25	40- 40	225.1	255.1
	50- 50	226.1	256.1
	80-100	227.1	257.1
	150-600	228.1	258.1
40	50- 50	230.1	259.1
	80- 80	231.1	260.1
	100-100	232.1	261.1
	150-300	233.1	262.1
	350-600	234.1	263.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450 76.81.73.002.1	450 76.81.73.502.1
840 76.81.73.004.1	840 76.81.73.504.1
1230 76.81.73.006.1	1230 76.81.73.506.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356 76.80.62.402.1	230 76.83.36.251.1
813 76.80.62.404.1	255 76.83.36.252.1
1219 76.80.62.406.1	305 76.83.36.253.1
1524 76.80.62.408.1	355 76.83.36.255.1
1829 76.80.62.410.1	405 76.83.36.256.1
2134 76.80.62.412.1	455 76.83.36.257.1
2438 76.80.62.414.1	
2743 76.80.62.416.1	
3048 76.80.62.418.1	

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 60	63.153.1
					20	4	1/2	* 70	63.155.1
					25	4	1/2	* 70	63.155.1
					40	4	1/2	* 80	63.157.1
					50	4	5/8	* 80	63.269.1
80	4	5/8	* 90	63.271.1	80	4	5/8	* 100	63.273.1
100	8	5/8	* 100	63.273.1	100	8	5/8	* 100	63.273.1
150	8	3/4	* 110	63.330.1	150	8	3/4	* 100	63.329.1
200	8	3/4	* 110	63.330.1	200	8	3/4	* 110	63.330.1
250	12	7/8	* 130	63.403.1	250	12	7/8	* 120	63.401.1
300	12	7/8	* 140	63.404.1	300	12	7/8	* 120	63.401.1
350	12	1	* 150	63.471.1	350	12	1	* 130	63.468.1
400	16	1	* 160	63.472.1	400	16	1	* 140	63.469.1
450	16	1 1/8	* 180	63.533.1	450	16	1 1/8	* 150	63.529.1
500	20	1 1/8	* 190	63.535.1	500	20	1 1/8	* 160	63.530.1
600	20	1 1/4	* 230	63.598.1	600	20	1 1/4	* 180	63.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	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
					80	8	3/4	* 150	63.337.1
					100	12	3/4	* 140	63.335.1
					150	12	3/4	* 140	63.335.1
					200	12	7/8	* 150	63.406.1
					250	16	1	* 170	63.474.1
					300	16	1 1/8	* 190	63.535.1
					350	20	1 1/8	* 200	63.524.1
					400	20	1 1/4	* 210	63.595.1
					450	24	1 1/4	* 220	63.597.1
					500	24	1 1/4	* 230	63.598.1
					600	24	1 1/2	* 260	63.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 70	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	4	5/8	* 90	63.271.1	50	4	5/8	* 150	63.281.1
80	4	5/8	* 110	63.274.1	80	4	5/8	* 170	63.284.1
100	8	5/8	* 110	63.274.1	100	8	5/8	* 170	63.284.1
150	8	3/4	* 120	63.332.1	150	8	3/4	* 210	63.346.1
200	8	3/4	* 130	63.334.1	200	8	3/4	* 240	63.351.1
250	12	7/8	* 140	63.404.1	250	12	7/8	* 290	63.428.1
300	12	7/8	* 150	63.406.1	300	12	7/8	* 310	63.432.1
350	12	1	* 160	63.472.1	350	12	1	* 330	63.500.1
400	16	1	* 170	63.474.1	400	16	1	* 330	63.500.1
450	16	1 1/8	* 180	63.533.1	450	16	1 1/8	* 360	63.562.1
500	20	1 1/8	* 200	63.524.1	500	20	1 1/8	* 390	63.566.1
600	20	1 1/4	* 220	63.597.1	600	20	1 1/4	* 400	63.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.002.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.403.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.404.1	
WELDING NECK FLANGE	1	76.66.29.036.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.803.1	
WELDING NECK FLANGE	2	76.66.29.034.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.803.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
* 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	76.65.61.012.1	
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	76.83.36.251.1	
* 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	76.65.61.012.1	
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	76.83.36.252.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.002.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.013.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.014.1	
WELDING NECK FLANGE	1	76.66.29.036.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.014.1	

CLASS 13834

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120
-----	-----					
	PRESSURE BAR GA					
DN15 -600	19.9	19.9	19.5	18.6	17.6	16.9

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - WHERE TWO OPTIONS ARE GIVEN FOR PIPE, 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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	E	B	B	B	B	A				80	10S
250	C	C	C	C	E	E	E	E	B	B	B	A					100	10S
200	C	C	C	C	E	E	E	B	B	B	A						150	10S
150	C	C	C	C	E	B	B	B	A								200	10S
100	C	C	C	C	B	B	B	A									250	10S
80	C	C	C	B	B	B	A										300	10S
50	C	B	B	B	A												350	10S
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, LT SOUR	PLANT :	
CLASS NO. : 13834	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 13834, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN150-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BAFF BALL VALVE FULL BORE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BARF BALL VALVE RED. BORE FLANGED	DN 15-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BTFB BALL VALVE FULL BORE TRUN FLGD	DN200-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD	DN300-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,PTFE
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,STELLITE 6
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNf MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKTI GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
STYB STRAINER Y-TYPE	DN 50-400	SIEVE: ASTM A240 UNS S31803
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.48.374.1			
25* 15		36.43.025.1	36.58.025.1	36.83.025.1	400* 80	78.48.398.1			
25* 20		36.43.041.1	36.58.041.1	36.83.041.1	400*100	78.48.420.1			
40* 15		36.43.057.1	36.58.057.1	36.83.057.1	400*150	78.48.440.1			
40* 20		36.43.075.1	36.58.075.1	36.83.075.1	400*200		36.43.631.1	36.58.631.1	36.83.631.1
40* 25		36.43.086.1	36.58.086.1	36.83.086.1	400*250		36.43.648.1	36.58.648.1	36.83.648.1
50* 20		36.43.107.1	36.58.107.1	36.83.107.1	400*300		36.43.665.1	36.58.665.1	36.83.665.1
50* 25		36.43.120.1	36.58.120.1	36.83.120.1	400*350		36.43.682.1	36.58.682.1	36.83.682.1
50* 40		36.43.136.1	36.58.136.1	36.83.136.1	450* 50	78.48.376.1			
80* 40		36.43.152.1	36.58.152.1	36.83.152.1	450* 80	78.48.400.1			
80* 50		36.43.170.1	36.58.170.1	36.83.170.1	450*100	78.48.422.1			
100* 40		36.43.186.1	36.58.186.1	36.83.186.1	450*150	78.48.442.1			
100* 50		36.43.205.1	36.58.205.1	36.83.205.1	450*200			36.83.699.1	
100* 80		36.43.224.1	36.58.224.1	36.83.224.1	450*250		36.43.714.1	36.58.714.1	36.83.714.1
150* 50	78.48.364.1				450*300		36.43.731.1	36.58.731.1	36.83.731.1
150* 80		36.43.243.1	36.58.243.1	36.83.243.1	450*350		36.43.748.1	36.58.748.1	36.83.748.1
150*100		36.43.260.1	36.58.260.1	36.83.260.1	450*400		36.43.765.1	36.58.765.1	36.83.765.1
200* 50	78.48.366.1				500* 50	78.48.378.1			
200* 80	78.48.390.1				500* 80	78.48.402.1			
200*100		36.43.280.1	36.58.280.1	36.83.280.1	500*100	78.48.424.1			
200*150		36.43.304.1	36.58.304.1	36.83.304.1	500*150	78.48.444.1			
250* 50	78.48.368.1				500*200	78.48.462.1			
250* 80	78.48.392.1				500*250			36.83.799.1	
250*100	78.48.414.1				500*300		36.43.816.1	36.58.816.1	36.83.816.1
250*150		36.43.351.1	36.58.351.1	36.83.351.1	500*350		36.43.833.1	36.58.833.1	36.83.833.1
250*200		36.43.374.1	36.58.374.1	36.83.374.1	500*400		36.43.850.1	36.58.850.1	36.83.850.1
300* 50	78.48.370.1				500*450		36.43.867.1	36.58.867.1	36.83.867.1
300* 80	78.48.394.1				600* 50	78.48.382.1			
300*100	78.48.416.1				600* 80	78.48.406.1			
300*150		36.43.409.1	36.58.409.1	36.83.409.1	600*100	78.48.428.1			
300*200		36.43.436.1	36.58.436.1	36.83.436.1	600*150	78.48.448.1			
300*250		36.43.470.1	36.58.470.1	36.83.470.1	600*200	78.48.466.1			
350* 50	78.48.372.1				600*250	78.48.482.1			
350* 80	78.48.396.1				600*300			36.83.901.1	
350*100	78.48.418.1				600*350			36.83.921.1	
350*150		36.43.504.1	36.58.504.1	36.83.504.1	600*400		36.43.941.1	36.58.941.1	36.83.941.1
350*200		36.43.530.1	36.58.530.1	36.83.530.1	600*450		36.43.961.1	36.58.961.1	36.83.961.1
350*250		36.43.563.1	36.58.563.1	36.83.563.1	600*500		36.43.981.1	36.58.981.1	36.83.981.1
350*300		36.43.596.1	36.58.596.1	36.83.596.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
15	40-150	201.1	241.1
	200-600	202.1	242.1
20	40- 80	203.1	243.1
	100-600	204.1	244.1
25	40- 40	225.1	255.1
	50- 50	226.1	256.1
	80-100	227.1	257.1
	150-600	228.1	258.1
40	50- 50	230.1	259.1
	80- 80	231.1	260.1
	100-100	232.1	261.1
	150-300	233.1	262.1
	350-600	234.1	263.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450	76.81.73.002.1
840	76.81.73.004.1
1230	76.81.73.006.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356	76.80.62.402.1
813	76.80.62.404.1
1219	76.80.62.406.1
1524	76.80.62.408.1
1829	76.80.62.410.1
2134	76.80.62.412.1
2438	76.80.62.414.1
2743	76.80.62.416.1
3048	76.80.62.418.1

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 60	67.153.1
					20	4	1/2	* 70	67.155.1
					25	4	1/2	* 70	67.155.1
					40	4	1/2	* 80	67.157.1
					50	4	5/8	* 80	67.269.1
80	4	5/8	* 90	67.271.1	80	4	5/8	* 100	67.273.1
100	8	5/8	* 100	67.273.1	100	8	5/8	* 100	67.273.1
150	8	3/4	* 110	67.330.1	150	8	3/4	* 100	67.329.1
200	8	3/4	* 110	67.330.1	200	8	3/4	* 110	67.330.1
250	12	7/8	* 130	67.403.1	250	12	7/8	* 120	67.401.1
300	12	7/8	* 140	67.404.1	300	12	7/8	* 120	67.401.1
350	12	1	* 150	67.471.1	350	12	1	* 130	67.468.1
400	16	1	* 160	67.472.1	400	16	1	* 140	67.469.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 150	67.529.1
500	20	1 1/8	* 190	67.535.1	500	20	1 1/8	* 160	67.530.1
600	20	1 1/4	* 230	67.598.1	600	20	1 1/4	* 180	67.590.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 70	67.155.1					
20	4	1/2	* 70	67.155.1					
25	4	1/2	* 80	67.157.1					
40	4	1/2	* 80	67.157.1					
50	4	5/8	* 90	67.271.1	50	4	5/8	* 150	67.281.1
80	4	5/8	* 110	67.274.1	80	4	5/8	* 170	67.284.1
100	8	5/8	* 110	67.274.1	100	8	5/8	* 170	67.284.1
150	8	3/4	* 120	67.332.1	150	8	3/4	* 210	67.346.1
200	8	3/4	* 130	67.334.1	200	8	3/4	* 240	67.351.1
250	12	7/8	* 140	67.404.1	250	12	7/8	* 290	67.429.1
300	12	7/8	* 150	67.406.1	300	12	7/8	* 310	67.432.1
350	12	1	* 160	67.472.1	350	12	1	* 330	67.500.1
400	16	1	* 170	67.474.1	400	16	1	* 330	67.500.1
450	16	1 1/8	* 180	67.533.1	450	16	1 1/8	* 360	67.562.1
500	20	1 1/8	* 200	67.544.1	500	20	1 1/8	* 390	67.566.1
600	20	1 1/4	* 220	67.597.1	600	20	1 1/4	* 400	67.625.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.002.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.403.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.404.1	
WELDING NECK FLANGE	1	76.66.29.036.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.404.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.803.1	
WELDING NECK FLANGE	2	76.66.29.034.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.803.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.004.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.803.1	
* 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	76.65.61.012.1	
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	76.83.36.251.1	
* 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	76.65.61.012.1	
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	76.83.36.252.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.002.1	
GASKET, RF TANGED INSERT	2	85.30.01.004.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.013.1	
WELDING NECK FLANGE	1	76.66.29.034.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.014.1	
WELDING NECK FLANGE	1	76.66.29.036.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.004.1	
GASKET, RF TANGED INSERT	2	85.30.01.006.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.014.1	

CLASS 16410

DESIGN LIMITS			
TEMPERATURE IN DEGREES CELSIUS			
0 50			

PRESSURE BAR GA			
DN15 -150	18.9	18.4	
NOTES			

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2			

BRANCH CONNECTIONS 90 DEGREES									TABLE OF SCHEDULES	
BRANCHSIZE									DN	SCHEDULE
RUN SIZE	15	20	25	40	50	80	100	150		

150	F	F	H	H	L	L	L	A	15	10S
100	F	F	H	H	L	L	A		20	10S
80	F	F	H	H	L	A			25	10S
50	K	K	K	B	A				40	10S
40	L	L	L	A					50	10S
25	B	B	A						80	10S
20	B	A							100	10S
15	A								150	10S

CODE	EXPLANATION OF CHARACTERS

A	EQUAL TEE
B	REDUCING TEE
F	CONCENTRIC REDUCER DN40 * REQUIRED BRANCH SIZE
H	CONCENTRIC REDUCER DN40 * REQUIRED BRANCH SIZE
K	REDUCING TEE DN50 * DN40 +
	CONCENTRIC REDUCER DN40 * REQUIRED BRANCH SIZE
L	EQUAL TEE + CONC. REDUCER TO REQUIRED BRANCH SIZE

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

TITANIUM		PLANT	:
CLASS NO. : 16410		CONSIGNEE	:
ANS RATING : CLASS 150		ENGINEERED BY	:
CORR. ALL. : 0 mm.		PRINCIPAL	:
REV. LETTER : A		CONTR.JOB NO.	:
REV. DATE : 07/97		PROJECT NO.	:

ISSUE DATE : DECEMBER 1998			

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

DEP 31.38.01.15-GEN. CLASS 16410, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-150	ASTM B337-2 UNS R50400
PNPP	PIPE NIPPLE 50MM	---	ASTM B337-2 UNS R50400

* FLANGES

BLFL	BLIND FLANGE	DN 15-150	ASTM A182-F316
FLIN	BLIND FLANGE LINER	DN 15-150	ASTM A363-WPT2 (TITANIUM)
LJFL	LAP-JOINT FLANGE	DN 15-150	ASTM A182-F316

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-150	ASTM A363-WPT2 (TITANIUM)
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A363-WPT2 (TITANIUM)
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A363-WPT2 (TITANIUM)
STBE	STUB-END	DN 15-150	ASTM A363-WPT2 (TITANIUM)
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A363-WPT2 (TITANIUM)

* REDUCING FITTINGS

RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A363-WPT2 (TITANIUM)
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A363-WPT2 (TITANIUM)
TERB	TEE REDUCING BUTT WELD ENDS	DN 20- 50	ASTM A363-WPT2 (TITANIUM)

* VALVES

BARW	BALL VALVE RED.B. WAFER TYPE	DN 15-150	BODY: ASTM B367-C2
			TRIM: BODY MAT,B381-F2,PTFE

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-150	GRAPHITE
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B8M CL.2/A194-8M

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 16410, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE		74.79.50	017.1	025.1	033.1	049.1	057.1	065.1	073.1	082.1
* FLANGES										
BLIND FLANGE		76.65.10	312.1	314.1	316.1	318.1	320.1	322.1	324.1	326.1
BLIND FLANGE LINER		76.80.81	011.1	012.1	013.1	015.1	016.1	017.1	018.1	020.1
LAP-JOINT FLANGE		76.65.20	408.1	412.1	416.1	418.1	420.1	422.1	424.1	426.1
* FITTINGS										
CAP BUTT-WELD.END		76.28.17	235.1	245.1	254.1	274.1	284.1	304.1	324.1	344.1
ELBOW 45 DEG BUTT-WELD ENDS		76.28.37	235.1	245.1	254.1	274.1	228.1	304.1	324.1	354.1
ELBOW 90 DEG BUTT-WELD ENDS		76.28.48	034.1	044.1	054.1	074.1	084.1	104.1	124.1	144.1
STUB-END		76.28.50	234.1	244.1	254.1	274.1	284.1	304.1	324.1	344.1
EQUAL TEE	BUTT-WELD ENDS	76.28.82	034.1	044.1	054.1	074.1	084.1	104.1	124.1	144.1
* VALVES										
BALL VALVE RED.B.	WAFER TYPE	77.06.09	003.1	004.1	005.1	007.1	008.1	010.1	012.1	014.1
* MISCELLANEOUS										
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	024.1

REDUCING/PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 16410, REV.A PAGE 4
ISSUE DATE : DECEMBER 1998

		RECB	REEB	TERB
		76.	76.	76.
RUN*	BR			
20*	15	28.70.065.1	28.80.065.1	28.92.813.1
25*	15	28.70.075.1	28.80.075.1	28.92.823.1
25*	20	28.70.085.1	28.80.085.1	28.92.833.1
40*	15	28.70.105.1	28.80.105.1	
40*	20	28.70.115.1	28.80.115.1	
40*	25	28.70.124.1	28.80.124.1	
50*	20	28.70.130.1	28.80.130.1	
50*	25	28.70.134.1	28.80.134.1	
50*	40	28.70.144.1	28.80.144.1	28.92.883.1
80*	40	28.70.174.1	28.80.174.1	
80*	50	28.70.184.1	28.80.184.1	
100*	40	28.70.194.1	28.80.194.1	
100*	50	28.70.204.1	28.80.204.1	
100*	80	28.70.214.1	28.80.214.1	
150*	80	28.70.224.1	28.80.224.1	
150*	100	28.70.234.1	28.80.234.1	

COMP.	
NAME	DESCRIPTION
-----	-----
RECB	REDUCER CONC BUTT WELD ENDS
REEB	REDUCER ECC BUTT WELD ENDS
TERB	TEE REDUCING BUTT WELD ENDS

BOLTING
BOLTSET FOR LAP FLANGES

BOLTSET WAFER CHECK VALVE

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ISSUE DATE : DECEMBER 1998

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
15	4	1/2	*	70	46.155.1				
20	4	1/2	*	70	46.155.1				
25	4	1/2	*	80	46.157.1				
40	4	1/2	*	80	46.157.1				
50	4	5/8	*	90	46.271.1	50	4	5/8	* 150
80	4	5/8	*	100	46.273.1	80	4	5/8	* 170
100	8	5/8	*	100	46.273.1	100	8	5/8	* 170
150	8	3/4	*	110	46.330.1	150	8	3/4	* 210

BOLTSET WAFERTYPE VALVES

81.38				
DN	NR	INCH	*	MM
15	4	1/2	*	110
20	4	1/2	*	110
25	4	1/2	*	130
40	4	1/2	*	150
50	4	5/8	*	170
80	4	5/8	*	220
100	8	5/8	*	240
150	8	3/4	*	290

CLASS 18410

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS

0 60

PRESSURE BAR GA

DN15 -100 15.5 15.5

NOTES

- DESIGN LIMITS ACC.TO VALVE RATING BS5154

- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY

- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

BRANCH CONNECTIONS 90 DEGREES								
RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	
100	O	O	O	O	R	R	T	
80	O	O	R	R	R	T		
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	40
100	40

CODE	EXPLANATION OF CHARACTERS
-----	-----
O	REDUCING TEE (THRD.) + REDUCING BUSHING (THRD.)
R	REDUCING TEE (THREADED)
T	EQUAL TEE (THREADED)

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL GALVANIZED	PLANT	:	
CLASS NO. : 18410	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 : DECEMBER 1998			

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

DEP 31.38.01.15-GEN. CLASS 18410, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-100	API 5L-B (GALVANISED)
PNTT	PIPE NIPPLE THRD. ENDS L= 50MM	DN 15- 25	API 5L-B (GALVANISED)
PT99	PIPE NIPPLE THRD. ENDS L=100MM	DN 15- 50	API 5L-B (GALVANISED)

* FLANGES

COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
LJFL	LAP-JOINT FLANGE	---	ASTM A105 (GALVANISED)

* FITTINGS

CAPT	CAP THREADED	DN 15-100	ASTM A234-WPB (GALVANISED)
COU	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

BARP	BALL VALVE RED.BORE FLANGED FF	DN 15-100	BODY: ASTM B148 TRIM: ASTM B148, PTFE
BART	BALL VALVE RED.BORE THREADED	DN 15- 50	BODY: ASTM B148 TRIM: ASTM B148, PTFE
CHVT	CHECK VALVE THREADED ENDS	DN 15- 50	BODY/TRIM: ASTM B148
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-100	BODY: ASTM B148 TRIM: ASTM B148/PTFE, FKM
GLVT	GLOBE VALVE THREADED ENDS	DN 15- 50	BODY: ASTM B148 TRIM: ASTM B148

* MISCELLANEOUS

GKGF	GASKET GRAPHITE FULL FACE	DN 15-100	GRAPHITE
GKTI	GASKET, RF TANGED INSERT	DN 15-100	GRAPHITE
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 18410, REV.B PAGE 3
 ISSUE DATE : DECEMBER 1998

		NOMINAL PIPE SIZE							
		15	20	25	40	50	80	100	
ITEM DESCRIPTION	MESC								

* PIPE									
PIPE	74.13.08	018.1	023.1	028.1	038.1	043.1	051.1	061.1	
PIPE NIPPLE THRD. ENDS L= 50MM	76.06.56	092.1	132.1	172.1					
PIPE NIPPLE THRD. ENDS L=100MM	76.06.56	094.1	134.1	174.1	194.1	214.1			
* FLANGES									
FLANGE THREADED FLAT FACE	76.62.50	028.1	032.1	036.1	038.1	040.1	042.1	044.1	
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									
BALL VALVE RED.BORE FLANGED FF	77.06.01	003.1	004.1	005.1	007.1	008.1	010.1	012.1	
BALL VALVE RED.BORE THREADED	77.07.01	003.1	004.1	005.1	007.1	008.1			
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	
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	
GASKET, RF TANGED INSERT	85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1	

		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 FLANGED JOINTS

BOLTSET WAFER CHECK VALVE

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	*	80	61.269.1	50	4	5/8	* 150
80	4	5/8	*	100	61.273.1	80	4	5/8	* 170
100	8	5/8	*	100	61.273.1	100	8	5/8	* 170

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	77.07.01.003.1	
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.2C	DN 40 -100
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)			
BALL VALVE RED.BORE THREADED	1	77.07.01.004.1	
CAP THREADED	1	76.06.18.012.1	
PIPE NIPPLE THRD. ENDS L= 50MM	2	76.06.56.132.1	
* PRESSURE INSTR.CONN.	DN 15	FIG.2C	DN 15 -100
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)			
BALL VALVE RED.BORE THREADED	1	77.07.01.003.1	
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	77.37.01.003.1	
PIPE NIPPLE THRD. ENDS L= 50MM	2	76.06.56.092.1	

* VENT POINT	DN 20	FIG.1C	DN 40 -100
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	

CLASS 18420

DESIGN LIMITS			
TEMPERATURE IN DEGREES CELSIUS			
0 60			

PRESSURE BAR GA			
DN15 -100	7.0	7.0	
NOTES			

- DESIGN LIMITS ACC.TO RATING OF DIAPHRAGM VALVES			

BRANCH CONNECTIONS 90 DEGREES								TABLE OF SCHEDULES	
RUN SIZE	BRANCHSIZE							DN	SCHEDULE
	15	20	25	40	50	80	100		
100	O	O	O	O	R	R	T	15	80
80	O	O	R	R	R	T		20	80
50	R	R	R	R	T			25	80
40	R	R	R	T				40	80
25	R	R	T					50	80
20	R	T						80	40
15	T							100	40

CODE	EXPLANATION OF CHARACTERS
-----	-----
O	REDUCING TEE (THRD.) + REDUCING BUSHING (THRD.)
R	REDUCING TEE (THREADED)
T	EQUAL TEE (THREADED)

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.			

CARBON STEEL GALVANIZED	PLANT	:	
CLASS NO. : 18420	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 : DECEMBER 1998			

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

DEP 31.38.01.15-GEN. CLASS 18420, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-100	API 5L-B (GALVANISED)
PNTT	PIPE NIPPLE THRD. ENDS L= 50MM	DN 15- 25	API 5L-B (GALVANISED)
PT99	PIPE NIPPLE THRD. ENDS L=100MM	DN 15- 50	API 5L-B (GALVANISED)

* FLANGES

COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
LJFL	LAP-JOINT FLANGE	---	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

DIVF	DIAPHRAGM VALVE	FLANGED	DN 25-100	BODY: ASTM B283-UNS C48500
DIVT	DIAPHRAGM VALVE	THREADED ENDS	DN 15- 50	DIAPHRAGM: NBR BODY: ASTM B283-UNS C48500 TRIM: ASTM B283-UNS C48500

* MISCELLANEOUS

GKGF	GASKET GRAPHITE FULL FACE	DN 15-100	GRAPHITE
GKTI	GASKET, RF TANGED INSERT	DN 15-100	GRAPHITE
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

DEP 31.38.01.15-GEN. CLASS 18420, REV.B PAGE 3
 ISSUE DATE : DECEMBER 1998

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	051.1	061.1
PIPE NIPPLE THRD. ENDS L= 50MM		76.06.56	092.1	132.1	172.1				
PIPE NIPPLE THRD. ENDS L=100MM		76.06.56	094.1	134.1	174.1	194.1	214.1		
* FLANGES									
FLANGE THREADED FLAT FACE		76.62.50	028.1	032.1	036.1	038.1	040.1	042.1	044.1
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									
DIAPHRAGM VALVE FLANGED		77.65.10			005.1	007.1	008.1	010.1	012.1
DIAPHRAGM VALVE THREADED ENDS		77.65.00	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
GASKET, RF TANGED INSERT		85.30.01	004.1	006.1	008.1	012.1	014.1	018.1	020.1
GASKET, ISOLATION SET		85.48.55	004.1	006.1	008.1	012.1	014.1	018.1	020.1

REDUCING/PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 18420, REV.B PAGE 4
ISSUE DATE : DECEMBER 1998

		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

BOLTSET WAFER CHECK VALVE

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	*	80	61.269.1	50	4	5/8	*	150
80	4	5/8	*	100	61.273.1	80	4	5/8	*	170
100	8	5/8	*	100	61.273.1	100	8	5/8	*	170

PIPING CLASSES ASME RATING 300

CLASS 31410

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA

DN15 -600 50.1 50.0 48.0 46.3 45.8

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.
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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 80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20 80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25 80
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40 80
350	C	C	C	C	E	E	E	B	B	B	B	A					50 40
300	C	C	C	C	E	E	E	B	B	B	A						80 40
250	C	C	C	C	E	E	E	B	B	A							100 40
200	C	C	C	C	E	E	B	B	A								150 40
150	C	C	C	C	E	B	B	A									200 30
100	C	C	C	B	B	B	A										250 30
80	C	C	C	B	B	A											300 30
50	C	B	B	B	A												350 30
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT :	
CLASS NO. : 31410	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

APIX PIPE (API 5L-B)	DN 15-400	API 5L-B (SML)
	DN450-600	API 5L-B (WLD)
PIPE PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A105
COFL COVER FLANGE THERMOWELL NOZZLE	---	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

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT+ENP,AISI 316
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: BODY MAT+ENP,AISI 316
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
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: AISI 316,STELLITE 6
GAVF GATE VALVE FLANGED	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
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	427.1			
	74.13.17														477.1	529.1	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
* 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																	
BALL VALVE FULL BORE TRUN FLGD	77.00.72					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.72					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.40								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.10.05	053.1	054.1	055.1	057.1												
	77.10.23					058.1	060.1	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	77.67.51					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												
GLOBE VALVE FLANGED	77.30.05	053.1	054.1	055.1	057.1												
	77.30.23					058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.95	423.1	424.1	425.1	427.1	428.1											
* 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	76.64.96	062.1	064.1	066.1	068.1												
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	76.83.37.121.1
813	76.80.60.064.1	255	76.83.37.122.1
1219	76.80.60.066.1	305	76.83.37.123.1
1524	76.80.60.068.1	355	76.83.37.125.1
1829	76.80.60.070.1	405	76.83.37.126.1
2134	76.80.60.072.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	61.155.1
					20	4	5/8	* 80	61.269.1
					25	4	5/8	* 80	61.269.1
					40	4	3/4	* 90	61.327.1
					50	8	5/8	* 90	61.271.1
80	8	3/4	* 100	61.329.1	80	8	3/4	* 110	61.330.1
100	8	3/4	* 100	61.329.1	100	8	3/4	* 120	61.332.1
150	12	3/4	* 110	61.330.1	150	12	3/4	* 130	61.334.1
200	12	7/8	* 130	61.403.1	200	12	7/8	* 140	61.404.1
250	16	1	* 140	61.469.1	250	16	1	* 160	61.472.1
300	16	1 1/8	* 160	61.530.1	300	16	1 1/8	* 170	61.532.1
350	20	1 1/8	* 180	61.533.1	350	20	1 1/8	* 180	61.533.1
400	24	1 1/4	* 210	61.595.1	400	20	1 1/4	* 190	61.592.1
450	24	1 1/4	* 220	61.597.1	450	24	1 1/4	* 200	61.588.1
500	24	1 1/4	* 230	61.598.1	500	24	1 1/4	* 210	61.595.1
600	24	1 1/2	* 270	61.682.1	600	24	1 1/2	* 240	61.687.1

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	5/8	* 80	61.269.1					
25	4	5/8	* 90	61.271.1					
40	4	3/4	* 100	61.329.1					
					50	8	5/8	* 150	61.281.1
					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	* 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	* 100	61.273.1	50	8	5/8	* 160	61.296.1
80	8	3/4	* 120	61.332.1	80	8	3/4	* 190	61.343.1
100	8	3/4	* 130	61.334.1	100	8	3/4	* 190	61.343.1
150	12	3/4	* 150	61.337.1	150	12	3/4	* 230	61.349.1
200	12	7/8	* 170	61.409.1	200	12	7/8	* 270	61.425.1
250	16	1	* 190	61.477.1	250	16	1	* 310	61.496.1
300	16	1 1/8	* 210	61.538.1	300	16	1 1/8	* 360	61.562.1
350	20	1 1/8	* 220	61.540.1	350	20	1 1/8	* 410	61.570.1
400	20	1 1/4	* 240	61.600.1	400	20	1 1/4	* 440	61.630.1
450	24	1 1/4	* 250	61.586.1	450	24	1 1/4	* 470	61.634.1
500	24	1 1/4	* 260	61.603.1	500	24	1 1/4	* 510	83.142.1
600	24	1 1/2	* 300	61.696.1	600	24	1 1/2	* 570	83.288.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.423.1	
WELDING NECK FLANGE	1	76.62.78.602.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
WELDING NECK FLANGE	1	76.62.78.604.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
WELDING NECK FLANGE	2	76.62.78.602.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.78.602.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.78.602.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.023.1	
WELDING NECK FLANGE	1	76.62.78.602.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	
WELDING NECK FLANGE	1	76.62.78.604.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	

CLASS 31420

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA

DN15 -600 50.5 50.0 48.0 46.3 45.8

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	40
300	C	C	C	C	E	E	E	E	B	B	B	A					80	40
250	C	C	C	C	E	E	E	E	B	B	A						100	40
200	C	C	C	C	E	E	E	B	B	A							150	40
150	C	C	C	C	E	B	B	A									200	30
100	C	C	C	B	B	B	A										250	30
80	C	C	C	B	B	A											300	30
50	C	B	B	B	A												350	30
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 31420	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31420, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BTFF BALL VALVE FULL BORE TRUN FLGD DN 50-600 BODY: ASTM A216-WCB/WCC,A105
TRIM: BODY MAT+ENP,AISI 316
BTRF BALL VALVE RED. BORE TRUN FLGD DN 50-600 BODY: ASTM A216-WCB/WCC,A105
TRIM: BODY MAT+ENP,AISI 316
BUVW BUTTERFLY VALVE WAFER TYPE DN150-600 BODY: ASTM A216 WCB/WCC,A105
TRIM: AISI 316,STELLITE 6
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: AISI 316,STELLITE 6
GAVF GATE VALVE FLANGED 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
MSBF MONOFL SINGLE BLOCK BALL DN 15- 50 BODY: ASTM A352-LCC,A350-LF2
TRIM: AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE --- BODY: ASTM A350-LF2
TRIM: AISI 316,STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD --- BODY: ASTM A352-LCC,A350-LF2
TRIM: AISI 316

* 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-B7M/A194-2HM
BODY: ASTM A105
LEGT LEVEL GAUGE THROUGH VISION DN 20- 20 BOLT: ASTM A193-B7M/A194-2HM
MONEL 400
MTRR METER RUN DN 15- 40 LJ END FLANGES: ASTM A350-LF2
ASTM A105
ORFS ORIFICE FLANGE SET DN 50-600 ASTM A193-B7M/A194-2HM
STBT STUD BOLT WITH NUTS ---
STYB STRAINER Y-TYPE DN 50-400 SIEVE: AISI 316
TWSG THERMOWELL STRAIGHT DN 40- 40 MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	241.1	283.1	325.1	377.1	425.1	477.1	529.1	579.1
* 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																	
BALL VALVE FULL BORE TRUN FLGD	77.00.72					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.72					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.40								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.10.05	053.1	054.1	055.1	057.1												
	77.10.23					058.1	060.1	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	77.67.51					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												
GLOBE VALVE FLANGED	77.30.05	053.1	054.1	055.1	057.1												
	77.30.23					058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.95	423.1	424.1	425.1	427.1	428.1											
* 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	76.64.96	062.1	064.1	066.1	068.1												
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.66.062.1	450	76.81.66.562.1
840	76.81.66.064.1	840	76.81.66.564.1
1230	76.81.66.066.1	1230	76.81.66.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.422.1	230	76.83.37.121.1
813	76.80.60.424.1	255	76.83.37.122.1
1219	76.80.60.426.1	305	76.83.37.123.1
1524	76.80.60.428.1	355	76.83.37.125.1
1829	76.80.60.430.1	405	76.83.37.126.1
2134	76.80.60.432.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

				15	4	1/2	* 70
				20	4	5/8	* 80
				25	4	5/8	* 80
				40	4	3/4	* 90
				50	8	5/8	* 90
				80	8	3/4	* 110
100	8	3/4	* 100	100	8	3/4	* 120
150	12	3/4	* 110	150	12	3/4	* 130
200	12	7/8	* 130	200	12	7/8	* 140
250	16	1	* 140	250	16	1	* 160
300	16	1 1/8	* 160	300	16	1 1/8	* 170
350	20	1 1/8	* 180	350	20	1 1/8	* 180
400	24	1 1/4	* 210	400	20	1 1/4	* 190
450	24	1 1/4	* 220	450	24	1 1/4	* 200
500	24	1 1/4	* 230	500	24	1 1/4	* 210
600	24	1 1/2	* 270	600	24	1 1/2	* 240

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70				
20	4	5/8	* 80				
25	4	5/8	* 90				
40	4	3/4	* 100				
				50	8	5/8	* 150
				80	8	3/4	* 150
				100	12	3/4	* 140
				150	12	3/4	* 140
				200	12	7/8	* 150
				250	16	1	* 170
				300	16	1 1/8	* 190
				350	20	1 1/8	* 200
				400	20	1 1/4	* 210
				450	24	1 1/4	* 220
				500	24	1 1/4	* 230
				600	24	1 1/2	* 260

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	* 100	50	8	5/8	* 160
80	8	3/4	* 120	80	8	3/4	* 190
100	8	3/4	* 130	100	8	3/4	* 190
150	12	3/4	* 150	150	12	3/4	* 230
200	12	7/8	* 170	200	12	7/8	* 270
250	16	1	* 190	250	16	1	* 310
300	16	1 1/8	* 210	300	16	1 1/8	* 360
350	20	1 1/8	* 220	350	20	1 1/8	* 410
400	20	1 1/4	* 240	400	20	1 1/4	* 440
450	24	1 1/4	* 250	450	24	1 1/4	* 470
500	24	1 1/4	* 260	500	24	1 1/4	* 510
600	24	1 1/2	* 300	600	24	1 1/2	* 570

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.423.1	
WELDING NECK FLANGE	1	76.62.78.602.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
WELDING NECK FLANGE	1	76.62.78.604.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
WELDING NECK FLANGE	2	76.62.78.602.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.78.602.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.78.602.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.023.1	
WELDING NECK FLANGE	1	76.62.78.602.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	
WELDING NECK FLANGE	1	76.62.78.604.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	

CLASS 31430

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 51.0 50.0 48.0 46.3 45.8

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.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE
BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING
REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE
SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE
IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE
INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	160
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	80
300	C	C	C	C	E	E	E	B	B	B	A						80	80
250	C	C	C	C	E	E	E	B	B	A							100	80
200	C	C	C	C	E	E	B	B	A								150	80
150	C	C	C	C	E	B	B	A									200	40
100	C	C	C	B	B	B	A										250	40
80	C	C	C	B	B	A											300	40
50	C	B	B	B	A												350	40
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 31430	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

APIX PIPE (API 5L-B)	DN 15-400	API 5L-B (SML)
	DN450-600	API 5L-B (WLD)
PIPE PIPE	DN 15-600	ASTM A106-B

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A105
COFL COVER FLANGE THERMOWELL NOZZLE	---	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

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: AISI 316(L),PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: AISI 316(L),PTFE
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
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: AISI 316,STELLITE 6
GAVF GATE VALVE FLANGED	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
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	020.1	030.1	040.1	060.1	071.1	109.1	157.1	219.1	245.1	287.1	331.1	379.1	433.1			
	74.13.17														483.1	533.1	583.1
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 FULL BORE TRUN FLGD	77.00.73					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.73					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.40								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.10.05	053.1	054.1	055.1	057.1												
	77.10.23					058.1	060.1	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	77.67.51					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												
GLOBE VALVE FLANGED	77.30.05	053.1	054.1	055.1	057.1												
	77.30.23					058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.95	423.1	424.1	425.1	427.1	428.1											
* 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	76.64.96	062.1	064.1	066.1	068.1												
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	76.83.37.121.1
813	76.80.60.064.1	255	76.83.37.122.1
1219	76.80.60.066.1	305	76.83.37.123.1
1524	76.80.60.068.1	355	76.83.37.125.1
1829	76.80.60.070.1	405	76.83.37.126.1
2134	76.80.60.072.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	61.155.1
					20	4	5/8	* 80	61.269.1
					25	4	5/8	* 80	61.269.1
					40	4	3/4	* 90	61.327.1
					50	8	5/8	* 90	61.271.1
80	8	3/4	* 100	61.329.1	80	8	3/4	* 110	61.330.1
100	8	3/4	* 100	61.329.1	100	8	3/4	* 120	61.332.1
150	12	3/4	* 110	61.330.1	150	12	3/4	* 130	61.334.1
200	12	7/8	* 130	61.403.1	200	12	7/8	* 140	61.404.1
250	16	1	* 140	61.469.1	250	16	1	* 160	61.472.1
300	16	1 1/8	* 160	61.530.1	300	16	1 1/8	* 170	61.532.1
350	20	1 1/8	* 180	61.533.1	350	20	1 1/8	* 180	61.533.1
400	24	1 1/4	* 210	61.595.1	400	20	1 1/4	* 190	61.592.1
450	24	1 1/4	* 220	61.597.1	450	24	1 1/4	* 200	61.588.1
500	24	1 1/4	* 230	61.598.1	500	24	1 1/4	* 210	61.595.1
600	24	1 1/2	* 270	61.682.1	600	24	1 1/2	* 240	61.687.1

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	5/8	* 80	61.269.1					
25	4	5/8	* 90	61.271.1					
40	4	3/4	* 100	61.329.1					
					50	8	5/8	* 150	61.281.1
					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	* 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	* 100	61.273.1	50	8	5/8	* 160	61.296.1
80	8	3/4	* 120	61.332.1	80	8	3/4	* 190	61.343.1
100	8	3/4	* 130	61.334.1	100	8	3/4	* 190	61.343.1
150	12	3/4	* 150	61.337.1	150	12	3/4	* 230	61.349.1
200	12	7/8	* 170	61.409.1	200	12	7/8	* 270	61.425.1
250	16	1	* 190	61.477.1	250	16	1	* 310	61.496.1
300	16	1 1/8	* 210	61.538.1	300	16	1 1/8	* 360	61.562.1
350	20	1 1/8	* 220	61.540.1	350	20	1 1/8	* 410	61.570.1
400	20	1 1/4	* 240	61.600.1	400	20	1 1/4	* 440	61.630.1
450	24	1 1/4	* 250	61.586.1	450	24	1 1/4	* 470	61.634.1
500	24	1 1/4	* 260	61.603.1	500	24	1 1/4	* 510	83.142.1
600	24	1 1/2	* 300	61.696.1	600	24	1 1/2	* 570	83.288.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.423.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
WELDING NECK FLANGE	1	76.62.78.654.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
WELDING NECK FLANGE	2	76.62.78.652.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.023.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	
WELDING NECK FLANGE	1	76.62.78.654.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	

CLASS 31440

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA

DN15 -600 51.0 50.0 48.0 46.3 45.8

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.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	B	A	20 160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25 160
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40 160
350	C	C	C	C	E	E	E	B	B	B	B	A					50 80
300	C	C	C	C	E	E	E	B	B	B	A						80 80
250	C	C	C	C	E	E	E	B	B	A							100 80
200	C	C	C	C	E	E	B	B	A								150 80
150	C	C	C	C	E	B	B	A									200 40
100	C	C	C	B	B	B	A										250 40
80	C	C	C	B	B	A											300 40
50	C	B	B	B	A												350 40
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 31440	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31440, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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
* 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 TRUN FLGD	77.00.73					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.73					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.40								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.10.05	053.1	054.1	055.1	057.1												
	77.10.23					058.1	060.1	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	77.67.51					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												
GLOBE VALVE FLANGED	77.30.05	053.1	054.1	055.1	057.1												
	77.30.23					058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.95	423.1	424.1	425.1	427.1	428.1											
* 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	76.64.96	062.1	064.1	066.1	068.1												
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.66.062.1	450	76.81.66.562.1
840	76.81.66.064.1	840	76.81.66.564.1
1230	76.81.66.066.1	1230	76.81.66.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.422.1	230	76.83.37.121.1
813	76.80.60.424.1	255	76.83.37.122.1
1219	76.80.60.426.1	305	76.83.37.123.1
1524	76.80.60.428.1	355	76.83.37.125.1
1829	76.80.60.430.1	405	76.83.37.126.1
2134	76.80.60.432.1	455	76.83.37.127.1
2438	76.80.60.434.1		
2743	76.80.60.436.1		
3048	76.80.60.438.1		

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

				15	4	1/2	* 70
				20	4	5/8	* 80
				25	4	5/8	* 80
				40	4	3/4	* 90
				50	8	5/8	* 90
				80	8	3/4	* 110
100	8	3/4	* 100	100	8	3/4	* 120
150	12	3/4	* 110	150	12	3/4	* 130
200	12	7/8	* 130	200	12	7/8	* 140
250	16	1	* 140	250	16	1	* 160
300	16	1 1/8	* 160	300	16	1 1/8	* 170
350	20	1 1/8	* 180	350	20	1 1/8	* 180
400	24	1 1/4	* 210	400	20	1 1/4	* 190
450	24	1 1/4	* 220	450	24	1 1/4	* 200
500	24	1 1/4	* 230	500	24	1 1/4	* 210
600	24	1 1/2	* 270	600	24	1 1/2	* 240

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70				
20	4	5/8	* 80				
25	4	5/8	* 90				
40	4	3/4	* 100				
				50	8	5/8	* 150
				80	8	3/4	* 150
				100	12	3/4	* 140
				150	12	3/4	* 140
				200	12	7/8	* 150
				250	16	1	* 170
				300	16	1 1/8	* 190
				350	20	1 1/8	* 200
				400	20	1 1/4	* 210
				450	24	1 1/4	* 220
				500	24	1 1/4	* 230
				600	24	1 1/2	* 260

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	* 100	50	8	5/8	* 160
80	8	3/4	* 120	80	8	3/4	* 190
100	8	3/4	* 130	100	8	3/4	* 190
150	12	3/4	* 150	150	12	3/4	* 230
200	12	7/8	* 170	200	12	7/8	* 270
250	16	1	* 190	250	16	1	* 310
300	16	1 1/8	* 210	300	16	1 1/8	* 360
350	20	1 1/8	* 220	350	20	1 1/8	* 410
400	20	1 1/4	* 240	400	20	1 1/4	* 440
450	24	1 1/4	* 250	450	24	1 1/4	* 470
500	24	1 1/4	* 260	500	24	1 1/4	* 510
600	24	1 1/2	* 300	600	24	1 1/2	* 570

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.423.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
WELDING NECK FLANGE	1	76.62.78.654.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
WELDING NECK FLANGE	2	76.62.78.652.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.023.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	
WELDING NECK FLANGE	1	76.62.78.654.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	

CLASS 31441

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 51.0 50.0 48.0 46.3 45.8

NOTES

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- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	80
300	C	C	C	C	E	E	E	E	B	B	B	A					80	80
250	C	C	C	C	E	E	E	E	B	B	A						100	80
200	C	C	C	C	E	E	E	B	B	A							150	80
150	C	C	C	C	E	B	B	A									200	40
100	C	C	C	C	B	B	B	A									250	40
80	C	C	C	B	B	B	A										300	40
50	C	B	B	B	B	A											350	40
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 31441	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31441, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A216 WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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
* 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 TRUN FLGD	77.00.91					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.91					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.70								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.10.43	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
DUAL PL. CHECK VALVE WAFER LUG	77.67.57					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	77.20.53	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED	77.30.53	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.97	423.1	424.1	425.1	427.1	428.1											
* 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	76.64.96	062.1	064.1	066.1	068.1												
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.66.062.1	450	76.81.66.562.1
840	76.81.66.064.1	840	76.81.66.564.1
1230	76.81.66.066.1	1230	76.81.66.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.422.1	230	76.83.37.121.1
813	76.80.60.424.1	255	76.83.37.122.1
1219	76.80.60.426.1	305	76.83.37.123.1
1524	76.80.60.428.1	355	76.83.37.125.1
1829	76.80.60.430.1	405	76.83.37.126.1
2134	76.80.60.432.1	455	76.83.37.127.1
2438	76.80.60.434.1		
2743	76.80.60.436.1		
3048	76.80.60.438.1		

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

				15	4	1/2	* 70
				20	4	5/8	* 80
				25	4	5/8	* 80
				40	4	3/4	* 90
				50	8	5/8	* 90
				80	8	3/4	* 110
100	8	3/4	* 100	100	8	3/4	* 120
150	12	3/4	* 110	150	12	3/4	* 130
200	12	7/8	* 130	200	12	7/8	* 140
250	16	1	* 140	250	16	1	* 160
300	16	1 1/8	* 160	300	16	1 1/8	* 170
350	20	1 1/8	* 180	350	20	1 1/8	* 180
400	24	1 1/4	* 210	400	20	1 1/4	* 190
450	24	1 1/4	* 220	450	24	1 1/4	* 200
500	24	1 1/4	* 230	500	24	1 1/4	* 210
600	24	1 1/2	* 270	600	24	1 1/2	* 240

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70				
20	4	5/8	* 80				
25	4	5/8	* 90				
40	4	3/4	* 100				
				50	8	5/8	* 150
				80	8	3/4	* 150
				100	12	3/4	* 140
				150	12	3/4	* 140
				200	12	7/8	* 150
				250	16	1	* 170
				300	16	1 1/8	* 190
				350	20	1 1/8	* 200
				400	20	1 1/4	* 210
				450	24	1 1/4	* 220
				500	24	1 1/4	* 230
				600	24	1 1/2	* 260

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	* 100	50	8	5/8	* 160
80	8	3/4	* 120	80	8	3/4	* 190
100	8	3/4	* 130	100	8	3/4	* 190
150	12	3/4	* 150	150	12	3/4	* 230
200	12	7/8	* 170	200	12	7/8	* 270
250	16	1	* 190	250	16	1	* 310
300	16	1 1/8	* 210	300	16	1 1/8	* 360
350	20	1 1/8	* 220	350	20	1 1/8	* 410
400	20	1 1/4	* 240	400	20	1 1/4	* 440
450	24	1 1/4	* 250	450	24	1 1/4	* 470
500	24	1 1/4	* 260	500	24	1 1/4	* 510
600	24	1 1/2	* 300	600	24	1 1/2	* 570

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.423.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.424.1	
WELDING NECK FLANGE	1	76.62.78.654.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.323.1	
WELDING NECK FLANGE	2	76.62.78.652.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.323.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.323.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.323.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.323.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.323.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.023.1	
WELDING NECK FLANGE	1	76.62.78.652.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.024.1	
WELDING NECK FLANGE	1	76.62.78.654.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.024.1	

CLASS 31450

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	120	150	200
-----	-----						
	PRESSURE BAR GA						
DN15 -600	50.1	50.0	48.0	46.3	45.8	45.1	43.8

NOTES

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- 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40
300	C	C	C	C	E	E	E	B	B	B	A						80	40
250	C	C	C	C	E	E	E	B	B	A							100	40
200	C	C	C	C	E	E	B	B	A								150	40
150	C	C	C	C	E	B	B	A									200	30
100	C	C	C	B	B	B	A										250	30
80	C	C	C	B	B	A											300	30
50	C	B	B	B	A												350	30
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL	PLANT	:	
CLASS NO. : 31450	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31450, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

APIX PIPE (API 5L-B)	DN 15-400	API 5L-B (SML)
	DN450-600	API 5L-B (WLD)
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- 40	BODY: ASTM A216-WCB/WCC,A105
	DN 50-600	TRIM: AISI 316(L),STELLITE 6
		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: AISI 316,STELLITE 6
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
	DN 50-600	TRIM: AISI 316(L),STELLITE 6
		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	MONEL 400
		LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1	211.1	241.1	283.1	325.1	377.1	427.1			
	74.13.17														477.1	529.1	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
* 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												
	77.10.23					058.1	060.1	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	77.67.51					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												
	77.20.23					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												
	77.30.23					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	76.64.96	062.1	064.1	066.1	068.1												
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	76.83.37.121.1
813	76.80.60.064.1	255	76.83.37.122.1
1219	76.80.60.066.1	305	76.83.37.123.1
1524	76.80.60.068.1	355	76.83.37.125.1
1829	76.80.60.070.1	405	76.83.37.126.1
2134	76.80.60.072.1	455	76.83.37.127.1
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

BOLTSET METER-RUN

BOLTSET SPECTACLE/SPACERBOLTSET WAFER CHECK VALVE

ASSEMBLIES

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* PRESSURE INSTR.CONN.      DN 15  FIG.OI      DN 50 -600
Branch:S : (N=br.tab,:S=BNIF,: =N/A)  1 (PIPING.COM.)
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  76.62.78.602.1
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* VENT POINT                DN 20  FIG.11  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

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CLASS 31460

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	120	150	200

	PRESSURE BAR GA						
DN15 -600	50.5	50.0	48.0	46.3	45.8	45.1	43.8

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - 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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40
300	C	C	C	C	E	E	E	B	B	B	A						80	40
250	C	C	C	C	E	E	E	B	B	A							100	40
200	C	C	C	C	E	E	B	B	A								150	40
150	C	C	C	C	E	B	B	A									200	30
100	C	C	C	B	B	B	A										250	30
80	C	C	C	B	B	A											300	30
50	C	B	B	B	A												350	30
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 31460	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31460, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* 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- 40 BODY: ASTM A216-WCB/WCC,A105
DN 50-600 TRIM: AISI 316(L),STELLITE 6
CHWL DUAL PL. CHECK VALVE WAFER LUG DN 50-600 BODY: ASTM A216-WCB/WCC,A105
TRIM: AISI 316,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
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-B7M/A194-2HM
LEGT LEVEL GAUGE THROUGH VISION DN 20- 20 BODY: ASTM A105
BOLT: ASTM A193-B7M/A194-2HM
MTRR METER RUN DN 15- 40 MONEL 400
LJ END FLANGES: ASTM A350-LF2
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 MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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
* 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 FLANGED	77.10.05	053.1	054.1	055.1	057.1												
	77.10.23					058.1	060.1	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	77.67.51					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												
	77.20.23					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												
	77.30.23					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	76.64.96	062.1	064.1	066.1	068.1												
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.66.062.1	450	76.81.66.562.1
840	76.81.66.064.1	840	76.81.66.564.1
1230	76.81.66.066.1	1230	76.81.66.566.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.422.1	230	76.83.37.121.1
813	76.80.60.424.1	255	76.83.37.122.1
1219	76.80.60.426.1	305	76.83.37.123.1
1524	76.80.60.428.1	355	76.83.37.125.1
1829	76.80.60.430.1	405	76.83.37.126.1
2134	76.80.60.432.1	455	76.83.37.127.1
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	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	* 170	66.532.1					
350	20	1	* 180	66.533.1					
400	20	1	* 190	66.592.1					
450	24	1	* 200	66.588.1					
500	24	1	* 210	66.595.1					
600	24	1	* 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

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	5/8	* 160	66.286.1
80	8	3/4	* 190	66.343.1
100	8	3/4	* 190	66.343.1
150	12	3/4	* 230	66.349.1
200	12	7/8	* 270	66.425.1
250	16	1	* 310	66.496.1
300	16	1 1/8	* 360	66.562.1
350	20	1 1/8	* 410	66.570.1
400	20	1 1/4	* 440	66.630.1
450	24	1 1/4	* 470	66.634.1
500	24	1 1/4	* 510	86.142.1
600	24	1 1/2	* 570	86.288.1

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    76.62.11.108.1
GASKET, RF TANGED INSERT     2    85.30.01.104.1
GATE VALVE FLANGED           1    77.20.04.053.1
STUD BOLT WITH NUTS           8    81.38.66.155.1
WELDING NECK FLANGE          1    76.62.78.602.1

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* DRAIN POINT                DN 20  FIG.OI  DN 40 - 40
Branch:N (N=br.tab,S=BNIF,=N/A) 1(PIPING COMP.)
BLIND FLANGE                  1 76.62.11.112.1
GASKET, RF TANGED INSERT     2 85.30.01.106.1
GATE VALVE FLANGED           1 77.20.04.054.1
STUD BOLT WITH NUTS           8 81.38.66.269.1
WELDING NECK FLANGE          1 76.62.78.604.1

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* 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 81.38.66.269.1

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```

* ORIFICE INTR.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  76.62.20.108.1
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.0I  DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:S=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
WELDING NECK FLANGE           1  76.62.78.602.1

```

```

* PRESSURE INSTR.CONN.      DN 15  FIG.0I      DN 50 -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
WELDING NECK FLANGE           1  76.62.78.602.1

```

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* 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      77.20.04.053.1
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

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* TEMPERATURE INSTR.C.   DN 40  FIG.AA  DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING.COM.)
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  76.83.37.121.1

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* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -600
Branch: (:=N;br,tab,:S=BNIF,:=N/A) 1(PIPING.COM.)
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                  1  76.83.37.122.1

```

```

* VENT POINT                DN 15  FIG.11  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIFF,:=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 76.62.78.602.1

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* VENT POINT                      DN 20  FIG.11  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  76.62.78.604.1

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* VENT POINT                DN 20  FIG.1H  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,:N=N/A) 1(PIPING.COM.)
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

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CLASS 31470

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -600	47.9	47.9	47.3	46.0	45.0	44.6

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	80
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	E	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	E	B	B	B	B	A			40	80
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	40
300	C	C	C	C	E	E	E	E	B	B	B	A					80	40
250	C	C	C	C	E	E	E	E	B	B	A						100	40
200	C	C	C	C	E	E	E	B	B	A							150	40
150	C	C	C	C	E	B	B	A									200	30
100	C	C	C	B	B	B	A										250	30
80	C	C	C	B	B	A											300	30
50	C	B	B	B	A												350	30
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP.	PLANT :	
CLASS NO. : 31470	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31470, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

31470, 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	74.30.17	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	166.1	206.1	237.1

* 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	718.1	720.1	724.1

* 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	385.1	395.1	405.1
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	385.1	395.1	405.1
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	385.1	395.1	405.1
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	385.1	395.1	405.1

* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.82					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.82					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.41								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
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
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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												
GLOBE VALVE FLANGED	77.30.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.95	423.1	424.1	425.1	427.1	428.1											

* 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	76.64.96	062.1	064.1	066.1	068.1												
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	76.83.19					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	79.04.371.1			
80* 40		31.70.226.1	31.71.226.1	31.85.127.1	450* 80	79.04.383.1			
80* 50	79.04.810.1	31.70.235.1	31.71.235.1	31.85.132.1	450*100	79.04.395.1			
100* 40		31.70.250.1	31.71.250.1	31.85.145.1	450*150	79.04.405.1			
100* 50	79.04.812.1	31.70.265.1	31.71.265.1	31.85.153.1	450*200	79.04.466.1	31.70.502.1	31.71.502.1	31.85.579.1
100* 80	79.04.836.1	31.70.275.1	31.71.275.1	31.85.165.1	450*250	79.04.482.1	31.70.521.1	31.71.521.1	31.85.603.1
150* 50	79.04.814.1				450*300	79.04.496.1	31.70.551.1	31.71.551.1	31.85.627.1
150* 80	79.04.838.1	31.70.295.1	31.71.295.1	31.85.177.1	450*350	79.04.508.1	31.70.582.1	31.71.582.1	31.85.651.1
150*100	79.04.860.1	31.70.305.1	31.71.305.1	31.85.189.1	450*400	79.04.518.1	31.70.612.1	31.71.612.1	31.85.675.1
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	31.70.324.1	31.71.324.1	31.85.211.1	500*100	79.04.396.1			
200*150	79.04.400.1	31.70.334.1	31.71.334.1	31.85.231.1	500*150	79.04.406.1			
250* 50	79.04.367.1				500*200	79.04.468.1	29.44.901.1	29.59.901.1	31.85.699.1
250* 80	79.04.379.1				500*250	79.04.484.1	31.70.634.1	31.71.634.1	31.85.723.1
250*100	79.04.391.1	29.44.342.1	29.59.342.1	31.85.259.1	500*300	79.04.498.1	31.70.641.1	31.71.641.1	31.85.747.1
250*150	79.04.401.1	31.70.352.1	31.71.352.1	31.85.277.1	500*350	79.04.510.1	31.70.672.1	31.71.672.1	31.85.771.1
250*200	79.04.458.1	31.70.363.1	31.71.363.1	31.85.290.1	500*400	79.04.520.1	31.70.702.1	31.71.702.1	31.85.795.1
300* 50	79.04.368.1				500*450	79.04.528.1	31.70.732.1	31.71.732.1	31.85.819.1
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	31.70.381.1	31.71.381.1	31.85.316.1	600*100	79.04.398.1			
300*200	79.04.460.1	31.70.394.1	31.71.394.1	31.85.327.1	600*150	79.04.408.1			
300*250	79.04.476.1	31.70.403.1	31.71.403.1	31.85.349.1	600*200	79.04.472.1			
350* 50	79.04.369.1				600*250	79.04.488.1	31.70.802.1	31.71.802.1	31.85.843.1
350* 80	79.04.381.1				600*300	79.04.502.1	31.70.822.1	31.71.822.1	31.85.867.1
350*100	79.04.393.1				600*350	79.04.514.1	31.70.842.1	31.71.842.1	31.85.891.1
350*150	79.04.403.1	31.70.412.1	31.71.412.1	31.85.378.1	600*400	79.04.524.1	31.70.882.1	31.71.882.1	31.85.915.1
350*200	79.04.462.1	31.70.421.1	31.71.421.1	31.85.389.1	600*450	79.04.532.1	31.70.912.1	31.71.912.1	31.85.939.1
350*250	79.04.478.1	31.70.433.1	31.71.433.1	31.85.414.1	600*500	79.04.538.1	31.70.942.1	31.71.942.1	31.85.963.1
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	76.83.37.121.1
813	76.80.60.264.1	255	76.83.37.122.1
1219	76.80.60.266.1	305	76.83.37.123.1
1524	76.80.60.268.1	355	76.83.37.125.1
1829	76.80.60.270.1	405	76.83.37.126.1
2134	76.80.60.272.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	63.155.1
					20	4	5/8	* 80	63.269.1
					25	4	5/8	* 80	63.269.1
					40	4	3/4	* 90	63.327.1
					50	8	5/8	* 90	63.271.1
80	8	3/4	* 100	63.329.1	80	8	3/4	* 110	63.330.1
100	8	3/4	* 100	63.329.1	100	8	3/4	* 120	63.332.1
150	12	3/4	* 110	63.330.1	150	12	3/4	* 130	63.334.1
200	12	7/8	* 130	63.403.1	200	12	7/8	* 140	63.404.1
250	16	1	* 140	63.469.1	250	16	1	* 160	63.472.1
300	16	1 1/8	* 160	63.530.1	300	16	1 1/8	* 170	63.532.1
350	20	1 1/8	* 180	63.533.1	350	20	1 1/8	* 180	63.533.1
400	24	1 1/4	* 210	63.595.1	400	20	1 1/4	* 190	63.592.1
450	24	1 1/4	* 220	63.597.1	450	24	1 1/4	* 200	63.588.1
500	24	1 1/4	* 230	63.598.1	500	24	1 1/4	* 210	63.595.1
600	24	1 1/2	* 270	63.682.1	600	24	1 1/2	* 240	63.687.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	63.155.1					
20	4	5/8	* 80	63.269.1					
25	4	5/8	* 90	63.271.1					
40	4	3/4	* 100	63.329.1					
					50	8	5/8	* 150	63.281.1
					80	8	3/4	* 150	63.337.1
					100	12	3/4	* 140	63.335.1
					150	12	3/4	* 140	63.335.1
					200	12	7/8	* 150	63.406.1
					250	16	1	* 170	63.474.1
					300	16	1 1/8	* 190	63.535.1
					350	20	1 1/8	* 200	63.524.1
					400	20	1 1/4	* 210	63.595.1
					450	24	1 1/4	* 220	63.597.1
					500	24	1 1/4	* 230	63.598.1
					600	24	1 1/2	* 260	63.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 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	* 100	63.273.1	50	8	5/8	* 160	63.296.1
80	8	3/4	* 120	63.332.1	80	8	3/4	* 190	63.343.1
100	8	3/4	* 130	63.334.1	100	8	3/4	* 190	63.343.1
150	12	3/4	* 150	63.337.1	150	12	3/4	* 230	63.349.1
200	12	7/8	* 170	63.409.1	200	12	7/8	* 270	63.425.1
250	16	1	* 190	63.477.1	250	16	1	* 310	63.496.1
300	16	1 1/8	* 210	63.538.1	300	16	1 1/8	* 360	63.562.1
350	20	1 1/8	* 220	63.540.1	350	20	1 1/8	* 410	63.570.1
400	20	1 1/4	* 240	63.600.1	400	20	1 1/4	* 440	63.628.1
450	24	1 1/4	* 250	63.613.1	450	24	1 1/4	* 470	63.634.1
500	24	1 1/4	* 260	63.603.1	500	24	1 1/4	* 510	63.638.1
600	24	1 1/2	* 300	63.696.1	600	24	1 1/2	* 570	63.714.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.423.1	
WELDING NECK FLANGE	1	76.62.82.802.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
WELDING NECK FLANGE	1	76.62.82.804.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
WELDING NECK FLANGE	2	76.62.82.802.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.82.802.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.82.802.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.023.1	
WELDING NECK FLANGE	1	76.62.82.802.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	
WELDING NECK FLANGE	1	76.62.82.804.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	

CLASS 31480

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 0 50 75 100 120

PRESSURE BAR GA
DN15 -600 47.9 47.9 47.3 46.0 45.0 44.6

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	40
300	C	C	C	C	E	E	E	B	B	B	A						80	40
250	C	C	C	C	E	E	E	B	B	A							100	40
200	C	C	C	C	E	E	B	B	A								150	40
150	C	C	C	C	E	B	B	A									200	30
100	C	C	C	B	B	B	A										250	30
80	C	C	C	B	B	A											300	30
50	C	B	B	B	A												350	30
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 31480	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31480, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	74.30.16	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

* 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																	
BALL VALVE FULL BORE TRUN FLGD	77.00.82					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.82					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.41								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
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
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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												
GLOBE VALVE FLANGED	77.30.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.95	423.1	424.1	425.1	427.1	428.1											

* 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	76.64.96	062.1	064.1	066.1	068.1												
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			

RUN* BR	BROB				RECB				REEB				TERB			
	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.	76.
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												

BRANCH	RUN-PIPE	BNIF		BNIP	
		76.80.37	76.80.31	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	76.81.68.062.1	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	76.83.37.121.1
813	76.80.60.604.1	255	76.83.37.122.1
1219	76.80.60.606.1	305	76.83.37.123.1
1524	76.80.60.608.1	355	76.83.37.125.1
1829	76.80.60.610.1	405	76.83.37.126.1
2134	76.80.60.612.1	455	76.83.37.127.1
2438	76.80.60.614.1		
2743	76.80.60.616.1		
3048	76.80.60.618.1		

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	67.155.1
					20	4	5/8	* 80	67.269.1
					25	4	5/8	* 80	67.269.1
					40	4	3/4	* 90	67.327.1
					50	8	5/8	* 90	67.271.1
80	8	3/4	* 100	67.329.1	80	8	3/4	* 110	67.330.1
100	8	3/4	* 100	67.329.1	100	8	3/4	* 120	67.332.1
150	12	3/4	* 110	67.330.1	150	12	3/4	* 130	67.334.1
200	12	7/8	* 130	67.403.1	200	12	7/8	* 140	67.404.1
250	16	1	* 140	67.469.1	250	16	1	* 160	67.472.1
300	16	1 1/8	* 160	67.530.1	300	16	1 1/8	* 170	67.532.1
350	20	1 1/8	* 180	67.533.1	350	20	1 1/8	* 180	67.533.1
400	24	1 1/4	* 210	67.595.1	400	20	1 1/4	* 190	67.592.1
450	24	1 1/4	* 220	67.597.1	450	24	1 1/4	* 200	67.588.1
500	24	1 1/4	* 230	67.598.1	500	24	1 1/4	* 210	67.595.1
600	24	1 1/2	* 270	67.691.1	600	24	1 1/2	* 240	67.687.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	5/8	* 80	67.269.1					
25	4	5/8	* 90	67.271.1					
40	4	3/4	* 100	67.329.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 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	* 100	67.273.1	50	8	5/8	* 160	67.283.1
80	8	3/4	* 120	67.332.1	80	8	3/4	* 190	67.343.1
100	8	3/4	* 130	67.334.1	100	8	3/4	* 190	67.343.1
150	12	3/4	* 150	67.337.1	150	12	3/4	* 230	67.349.1
200	12	7/8	* 170	67.409.1	200	12	7/8	* 270	67.425.1
250	16	1	* 190	67.477.1	250	16	1	* 310	67.496.1
300	16	1 1/8	* 210	67.538.1	300	16	1 1/8	* 360	67.562.1
350	20	1 1/8	* 220	67.540.1	350	20	1 1/8	* 410	67.570.1
400	20	1 1/4	* 240	67.600.1	400	20	1 1/4	* 440	67.630.1
450	24	1 1/4	* 250	67.606.1	450	24	1 1/4	* 470	67.634.1
500	24	1 1/4	* 260	67.603.1	500	24	1 1/4	* 510	67.639.1
600	24	1 1/2	* 300	67.696.1	600	24	1 1/2	* 570	67.712.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.423.1	
WELDING NECK FLANGE	1	76.62.82.802.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
WELDING NECK FLANGE	1	76.62.82.804.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
WELDING NECK FLANGE	2	76.62.82.802.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.82.802.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.82.802.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.023.1	
WELDING NECK FLANGE	1	76.62.82.802.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	
WELDING NECK FLANGE	1	76.62.82.804.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	

CLASS 31490

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -600	47.9	47.9	47.3	46.0	45.0	44.6

- 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.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

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	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	80
300	C	C	C	C	E	E	E	B	B	B	B						80	80
250	C	C	C	C	E	E	E	B	B	B	A						100	80
200	C	C	C	C	E	E	B	B	B	A							150	80
150	C	C	C	C	E	B	B	A									200	40
100	C	C	C	C	B	B	B	A									250	40
80	C	C	C	B	B	B	A										300	40
50	C	B	B	B	A												350	40
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP.	PLANT :	
CLASS NO. : 31490	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : B	CONTR.JOB NO. :	
REV. DATE : 12/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31490, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A352+ENP,A350+ENP TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A352+ENP,A350+ENP TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 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
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
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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	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	76.88.34	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	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	76.31.18	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	76.31.38	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	76.31.39	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	76.31.84	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																	
BALL VALVE FULL BORE TRUN FLGD	77.00.83					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.83					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.41								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
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
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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												
GLOBE VALVE FLANGED	77.30.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.95	423.1	424.1	425.1	427.1	428.1											

* 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	76.64.96	062.1	064.1	066.1	068.1												
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

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		31.70.141.1	31.71.141.1	31.85.039.1	400* 50	79.05.074.1			
25* 15		31.70.151.1	31.71.151.1	31.85.049.1	400* 80	79.05.098.1			
25* 20		31.70.161.1	31.71.161.1	31.85.059.1	400*100	79.05.120.1			
40* 15		31.70.171.1	31.71.171.1	31.85.069.1	400*150	79.05.140.1	29.44.754.1	29.59.754.1	31.85.469.1
40* 20		31.70.181.1	31.71.181.1	31.85.079.1	400*200	79.04.908.1	31.70.453.1	31.71.453.1	31.85.479.1
40* 25		31.70.191.1	31.71.191.1	31.85.089.1	400*250	79.04.924.1	31.70.462.1	31.71.462.1	31.85.505.1
50* 20		29.44.193.1	29.59.193.1	31.85.102.1	400*300	79.04.938.1	31.70.474.1	31.71.474.1	31.85.531.1
50* 25		31.70.199.1	31.71.199.1	31.85.111.1	400*350	79.04.950.1	31.70.487.1	31.71.487.1	31.85.556.1
50* 40		31.70.208.1	31.71.208.1	31.85.120.1	450* 50	79.05.076.1			
80* 40		31.70.229.1	31.71.229.1	31.85.129.1	450* 80	79.05.100.1			
80* 50	79.05.360.1	31.70.237.1	31.71.237.1	31.85.133.1	450*100	79.05.122.1			
100* 40		31.70.253.1	31.71.253.1	31.85.147.1	450*150	79.05.142.1			
100* 50	79.05.362.1	31.70.267.1	31.71.267.1	31.85.154.1	450*200	79.04.910.1	31.70.503.1	31.71.503.1	31.85.580.1
100* 80	79.05.386.1	31.70.277.1	31.71.277.1	31.85.166.1	450*250	79.04.926.1	31.70.523.1	31.71.523.1	31.85.604.1
150* 50	79.05.364.1			450*300	79.04.940.1	31.70.553.1	31.71.553.1	31.85.628.1	
150* 80	79.05.388.1	31.70.297.1	31.71.297.1	31.85.178.1	450*350	79.04.952.1	31.70.584.1	31.71.584.1	31.85.652.1
150*100	79.05.410.1	31.70.307.1	31.71.307.1	31.85.190.1	450*400	79.04.962.1	31.70.614.1	31.71.614.1	31.85.676.1
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	31.70.326.1	31.71.326.1	31.85.212.1	500*100	79.05.124.1			
200*150	79.05.132.1	31.70.336.1	31.71.336.1	31.85.232.1	500*150	79.05.144.1			
250* 50	79.05.068.1			500*200	79.04.912.1	29.44.902.1	29.59.902.1	31.85.700.1	
250* 80	79.05.092.1			500*250	79.04.928.1	31.70.635.1	31.71.635.1	31.85.724.1	
250*100	79.05.114.1	31.70.344.1	31.71.344.1	31.85.261.1	500*300	79.04.942.1	31.70.643.1	31.71.643.1	31.85.748.1
250*150	79.05.134.1	31.70.356.1	31.71.356.1	31.85.278.1	500*350	79.04.954.1	31.70.674.1	31.71.674.1	31.85.772.1
250*200	79.04.902.1	31.70.365.1	31.71.365.1	31.85.291.1	500*400	79.04.964.1	31.70.704.1	31.71.704.1	31.85.796.1
300* 50	79.05.070.1			500*450	79.04.972.1	31.70.734.1	31.71.734.1	31.85.820.1	
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	31.70.384.1	31.71.384.1	31.85.317.1	600*100	79.05.128.1			
300*200	79.04.904.1	31.70.396.1	31.71.396.1	31.85.328.1	600*150	79.05.148.1			
300*250	79.04.920.1	31.70.404.1	31.71.404.1	31.85.350.1	600*200	79.04.916.1			
350* 50	79.05.072.1			600*250	79.04.932.1	31.70.803.1	31.71.803.1	31.85.844.1	
350* 80	79.05.096.1			600*300	79.04.946.1	31.70.823.1	31.71.823.1	31.85.868.1	
350*100	79.05.118.1			600*350	79.04.958.1	31.70.843.1	31.71.843.1	31.85.892.1	
350*150	79.05.138.1	31.70.414.1	31.71.414.1	31.85.379.1	600*400	79.04.968.1	31.70.884.1	31.71.884.1	31.85.916.1
350*200	79.04.906.1	31.70.422.1	31.71.422.1	31.85.390.1	600*450	79.04.976.1	31.70.914.1	31.71.914.1	31.85.940.1
350*250	79.04.922.1	31.70.438.1	31.71.438.1	31.85.415.1	600*500	79.04.982.1	31.70.944.1	31.71.944.1	31.85.964.1
350*300	79.04.936.1	31.70.447.1	31.71.447.1	31.85.441.1					

		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	76.81.67.062.1	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	76.83.37.121.1
813	76.80.60.264.1	255	76.83.37.122.1
1219	76.80.60.266.1	305	76.83.37.123.1
1524	76.80.60.268.1	355	76.83.37.125.1
1829	76.80.60.270.1	405	76.83.37.126.1
2134	76.80.60.272.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	63.155.1
					20	4	5/8	* 80	63.269.1
					25	4	5/8	* 80	63.269.1
					40	4	3/4	* 90	63.327.1
					50	8	5/8	* 90	63.271.1
80	8	3/4	* 100	63.329.1	80	8	3/4	* 110	63.330.1
100	8	3/4	* 100	63.329.1	100	8	3/4	* 120	63.332.1
150	12	3/4	* 110	63.330.1	150	12	3/4	* 130	63.334.1
200	12	7/8	* 130	63.403.1	200	12	7/8	* 140	63.404.1
250	16	1	* 140	63.469.1	250	16	1	* 160	63.472.1
300	16	1 1/8	* 160	63.530.1	300	16	1 1/8	* 170	63.532.1
350	20	1 1/8	* 180	63.533.1	350	20	1 1/8	* 180	63.533.1
400	24	1 1/4	* 210	63.595.1	400	20	1 1/4	* 190	63.592.1
450	24	1 1/4	* 220	63.597.1	450	24	1 1/4	* 200	63.588.1
500	24	1 1/4	* 230	63.598.1	500	24	1 1/4	* 210	63.595.1
600	24	1 1/2	* 270	63.682.1	600	24	1 1/2	* 240	63.687.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	63.155.1					
20	4	5/8	* 80	63.269.1					
25	4	5/8	* 90	63.271.1					
40	4	3/4	* 100	63.329.1					
					50	8	5/8	* 150	63.281.1
					80	8	3/4	* 150	63.337.1
					100	12	3/4	* 140	63.335.1
					150	12	3/4	* 140	63.335.1
					200	12	7/8	* 150	63.406.1
					250	16	1	* 170	63.474.1
					300	16	1 1/8	* 190	63.535.1
					350	20	1 1/8	* 200	63.524.1
					400	20	1 1/4	* 210	63.595.1
					450	24	1 1/4	* 220	63.597.1
					500	24	1 1/4	* 230	63.598.1
					600	24	1 1/2	* 260	63.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 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	* 100	63.273.1	50	8	5/8	* 160	63.296.1
80	8	3/4	* 120	63.332.1	80	8	3/4	* 190	63.343.1
100	8	3/4	* 130	63.334.1	100	8	3/4	* 190	63.343.1
150	12	3/4	* 150	63.337.1	150	12	3/4	* 230	63.349.1
200	12	7/8	* 170	63.409.1	200	12	7/8	* 270	63.425.1
250	16	1	* 190	63.477.1	250	16	1	* 310	63.496.1
300	16	1 1/8	* 210	63.538.1	300	16	1 1/8	* 360	63.562.1
350	20	1 1/8	* 220	63.540.1	350	20	1 1/8	* 410	63.570.1
400	20	1 1/4	* 240	63.600.1	400	20	1 1/4	* 440	63.628.1
450	24	1 1/4	* 250	63.613.1	450	24	1 1/4	* 470	63.634.1
500	24	1 1/4	* 260	63.603.1	500	24	1 1/4	* 510	63.638.1
600	24	1 1/2	* 300	63.696.1	600	24	1 1/2	* 570	63.714.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.423.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
WELDING NECK FLANGE	1	76.62.82.854.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
WELDING NECK FLANGE	2	76.62.82.852.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.023.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	
WELDING NECK FLANGE	1	76.62.82.854.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	

CLASS 31500

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120
-----	-----					
	PRESSURE BAR GA					
DN15 -600	47.9	47.9	47.3	46.0	45.0	44.6

- 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.
COLD BENDING IS NOT ALLOWED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	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	B	B	B	B	A				50	80
300	C	C	C	C	E	E	E	E	B	B	B	A					80	80
250	C	C	C	C	E	E	E	E	B	B	A						100	80
200	C	C	C	C	E	E	E	B	B	A							150	80
150	C	C	C	C	E	B	B	A									200	40
100	C	C	C	B	B	B	A										250	40
80	C	C	C	B	B	A											300	40
50	C	B	B	B	A												350	40
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 31500	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31500, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A352+ENP,A350+ENP TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A352+ENP,A350+ENP TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	MONEL 400
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
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

31500, 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	74.30.16	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																	
BALL VALVE FULL BORE TRUN FLGD	77.00.83					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.83					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.41								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
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
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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												
GLOBE VALVE FLANGED	77.30.33	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.95	423.1	424.1	425.1	427.1	428.1											
* 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	76.64.96	062.1	064.1	066.1	068.1												
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

	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	76.83.37.121.1
813	76.80.60.604.1	255	76.83.37.122.1
1219	76.80.60.606.1	305	76.83.37.123.1
1524	76.80.60.608.1	355	76.83.37.125.1
1829	76.80.60.610.1	405	76.83.37.126.1
2134	76.80.60.612.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	67.155.1
					20	4	5/8	* 80	67.269.1
					25	4	5/8	* 80	67.269.1
					40	4	3/4	* 90	67.327.1
					50	8	5/8	* 90	67.271.1
80	8	3/4	* 100	67.329.1	80	8	3/4	* 110	67.330.1
100	8	3/4	* 100	67.329.1	100	8	3/4	* 120	67.332.1
150	12	3/4	* 110	67.330.1	150	12	3/4	* 130	67.334.1
200	12	7/8	* 130	67.403.1	200	12	7/8	* 140	67.404.1
250	16	1	* 140	67.469.1	250	16	1	* 160	67.472.1
300	16	1 1/8	* 160	67.530.1	300	16	1 1/8	* 170	67.532.1
350	20	1 1/8	* 180	67.533.1	350	20	1 1/8	* 180	67.533.1
400	24	1 1/4	* 210	67.595.1	400	20	1 1/4	* 190	67.592.1
450	24	1 1/4	* 220	67.597.1	450	24	1 1/4	* 200	67.588.1
500	24	1 1/4	* 230	67.598.1	500	24	1 1/4	* 210	67.595.1
600	24	1 1/2	* 270	67.691.1	600	24	1 1/2	* 240	67.687.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	5/8	* 80	67.269.1					
25	4	5/8	* 90	67.271.1					
40	4	3/4	* 100	67.329.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 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	* 100	67.273.1	50	8	5/8	* 160	67.283.1
80	8	3/4	* 120	67.332.1	80	8	3/4	* 190	67.343.1
100	8	3/4	* 130	67.334.1	100	8	3/4	* 190	67.343.1
150	12	3/4	* 150	67.337.1	150	12	3/4	* 230	67.349.1
200	12	7/8	* 170	67.409.1	200	12	7/8	* 270	67.425.1
250	16	1	* 190	67.477.1	250	16	1	* 310	67.496.1
300	16	1 1/8	* 210	67.538.1	300	16	1 1/8	* 360	67.562.1
350	20	1 1/8	* 220	67.540.1	350	20	1 1/8	* 410	67.570.1
400	20	1 1/4	* 240	67.600.1	400	20	1 1/4	* 440	67.630.1
450	24	1 1/4	* 250	67.606.1	450	24	1 1/4	* 470	67.634.1
500	24	1 1/4	* 260	67.603.1	500	24	1 1/4	* 510	67.639.1
600	24	1 1/2	* 300	67.696.1	600	24	1 1/2	* 570	67.712.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.423.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
WELDING NECK FLANGE	1	76.62.82.854.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
WELDING NECK FLANGE	2	76.62.82.852.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.023.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.023.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.023.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	
WELDING NECK FLANGE	1	76.62.82.854.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.024.1	

CLASS 31501

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 0 50 75 100 120

PRESSURE BAR GA
DN15 -600 47.9 47.9 47.3 46.0 45.0 44.6

NOTES

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- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	B	B	B	B	A		20	160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	80
300	C	C	C	C	E	E	E	E	B	B	B	A					80	80
250	C	C	C	C	E	E	E	E	B	B	A						100	80
200	C	C	C	C	E	E	E	B	B	A							150	80
150	C	C	C	C	E	B	B	A									200	40
100	C	C	C	C	B	B	A										250	40
80	C	C	C	B	B	A											300	40
50	C	B	B	B	A												350	40
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

CARBON STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 31501	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 31501, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* 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
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-300	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* MISCELLANEOUS

GKTI	GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A333-6
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A350-LF2 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	MONEL 400
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
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

31501, REV.A 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	74.30.16	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																	
BALL VALVE FULL BORE TRUN FLGD	77.00.93					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.00.93					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.57.71								064.1	065.1	066.1	067.1					
CHECK VALVE FLANGED	77.10.44	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
DUAL PL. CHECK VALVE WAFER LUG	77.67.58					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	77.20.54	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED	77.30.54	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.00.97	423.1	424.1	425.1	427.1	428.1											
* 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	76.64.96	062.1	064.1	066.1	068.1												
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

	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	76.83.37.121.1
813	76.80.60.604.1	255	76.83.37.122.1
1219	76.80.60.606.1	305	76.83.37.123.1
1524	76.80.60.608.1	355	76.83.37.125.1
1829	76.80.60.610.1	405	76.83.37.126.1
2134	76.80.60.612.1	455	76.83.37.127.1
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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	67.155.1
					20	4	5/8	* 80	67.269.1
					25	4	5/8	* 80	67.269.1
					40	4	3/4	* 90	67.327.1
					50	8	5/8	* 90	67.271.1
80	8	3/4	* 100	67.329.1	80	8	3/4	* 110	67.330.1
100	8	3/4	* 100	67.329.1	100	8	3/4	* 120	67.332.1
150	12	3/4	* 110	67.330.1	150	12	3/4	* 130	67.334.1
200	12	7/8	* 130	67.403.1	200	12	7/8	* 140	67.404.1
250	16	1	* 140	67.469.1	250	16	1	* 160	67.472.1
300	16	1 1/8	* 160	67.530.1	300	16	1 1/8	* 170	67.532.1
350	20	1 1/8	* 180	67.533.1	350	20	1 1/8	* 180	67.533.1
400	24	1 1/4	* 210	67.595.1	400	20	1 1/4	* 190	67.592.1
450	24	1 1/4	* 220	67.597.1	450	24	1 1/4	* 200	67.588.1
500	24	1 1/4	* 230	67.598.1	500	24	1 1/4	* 210	67.595.1
600	24	1 1/2	* 270	67.691.1	600	24	1 1/2	* 240	67.687.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	5/8	* 80	67.269.1					
25	4	5/8	* 90	67.271.1					
40	4	3/4	* 100	67.329.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 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	* 100	67.273.1	50	8	5/8	* 160	67.283.1
80	8	3/4	* 120	67.332.1	80	8	3/4	* 190	67.343.1
100	8	3/4	* 130	67.334.1	100	8	3/4	* 190	67.343.1
150	12	3/4	* 150	67.337.1	150	12	3/4	* 230	67.349.1
200	12	7/8	* 170	67.409.1	200	12	7/8	* 270	67.425.1
250	16	1	* 190	67.477.1	250	16	1	* 310	67.496.1
300	16	1 1/8	* 210	67.538.1	300	16	1 1/8	* 360	67.562.1
350	20	1 1/8	* 220	67.540.1	350	20	1 1/8	* 410	67.570.1
400	20	1 1/4	* 240	67.600.1	400	20	1 1/4	* 440	67.630.1
450	24	1 1/4	* 250	67.606.1	450	24	1 1/4	* 470	67.634.1
500	24	1 1/4	* 260	67.603.1	500	24	1 1/4	* 510	67.639.1
600	24	1 1/2	* 300	67.696.1	600	24	1 1/2	* 570	67.712.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.423.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.424.1	
WELDING NECK FLANGE	1	76.62.82.854.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.323.1	
WELDING NECK FLANGE	2	76.62.82.852.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.323.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.323.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.323.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.323.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.323.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.023.1	
WELDING NECK FLANGE	1	76.62.82.852.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.024.1	
WELDING NECK FLANGE	1	76.62.82.854.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.024.1	

CLASS 33410

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-20	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -300	49.6	49.6	48.1	45.0	42.2	40.7

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
- FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- FOR BENDING OF PIPE SEE 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
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	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.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 33410	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 33410, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE PIPE DN 15-300 ASTM A312-TP316L

* FLANGES

BLFL BLIND FLANGE DN 15-300 ASTM A182-F316
COFL COVER FLANGE THERMOWELL NOZZLE --- 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

BTFF BALL VALVE FULL BORE TRUN FLGD DN 50-300 BODY: ASTM A182-F316/A351-CF8M
TRIM: AISI 316(L),PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD DN 50-300 BODY: ASTM A182-F316/A351-CF8M
TRIM: AISI 316(L),PTFE
BUVW BUTTERFLY VALVE WAFER TYPE DN150-300 BODY: ASTM A351-CF8M,A182-F316
TRIM: AISI 316(L),STELLITE 6
CHVF CHECK VALVE FLANGED DN 15-300 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),STELLITE 6
GAVF GATE VALVE FLANGED DN 15- 40 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
MSBF MONOFL SINGLE BLOCK BALL DN 15- 50 BODY: ASTM A182-F316,A351-CF8M
TRIM: AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE --- BODY: ASTM A182-F316,A351-CF8M
TRIM: AISI 316,STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD --- BODY: ASTM A182-F316,A351-CF8M
TRIM: AISI 316

* 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 MONEL 400
LJ END FLANGES: ASTM A350-LF2
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
TWSG THERMOWELL STRAIGHT DN 40- 40 MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

ITEM DESCRIPTION	MESC	NOMINAL PIPE SIZE										
		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
* 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												
BALL VALVE FULL BORE TRUN FLGD	77.03.74					558.1	560.1	562.1	564.1	565.1	566.1	567.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74					058.1	060.1	062.1	064.1	065.1	066.1	067.1
BUTTERFLY VALVE WAFER TYPE	77.58.40								064.1	065.1	066.1	067.1
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
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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							
GLOBE VALVE FLANGED	77.33.03	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
MONOFL SINGLE BLOCK BALL	77.03.90	123.1	124.1	125.1	127.1	128.1						
* 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	76.64.96	062.1	064.1	066.1	068.1							
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	76.83.37.121.1
813	76.80.61.464.1	255	76.83.37.122.1
1219	76.80.61.466.1	305	76.83.37.123.1
1524	76.80.61.468.1	355	76.83.37.125.1
1829	76.80.61.470.1	405	76.83.37.126.1
2134	76.80.61.472.1	455	76.83.37.127.1
2438	76.80.61.474.1		
2743	76.80.61.476.1		
3048	76.80.61.478.1		

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
					20	4	5/8	*	80
					25	4	5/8	*	80
					40	4	3/4	*	90
					50	8	5/8	*	90
80	8	3/4	*	100	80	8	3/4	*	110
100	8	3/4	*	100	100	8	3/4	*	120
150	12	3/4	*	110	150	12	3/4	*	130
200	12	7/8	*	130	200	12	7/8	*	140
250	16	1	*	140	250	16	1	*	160
300	16	1 1/8	*	160	300	16	1 1/8	*	170

BOLTSET METER-RUN BOLTSET ORIFICE FLANGES

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

15	4	1/2	*	70					
20	4	5/8	*	80					
25	4	5/8	*	90					
40	4	3/4	*	100					
					50	8	5/8	*	150
					80	8	3/4	*	150
					100	12	3/4	*	140
					150	12	3/4	*	140
					200	12	7/8	*	150
					250	16	1	*	170
					300	16	1 1/8	*	190

BOLTSET SPECTACLE/SPACER BOLTSET WAFER CHECK VALVE

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	*	100	50	8	5/8	*	160
80	8	3/4	*	120	80	8	3/4	*	190
100	8	3/4	*	130	100	8	3/4	*	190
150	12	3/4	*	150	150	12	3/4	*	230
200	12	7/8	*	170	200	12	7/8	*	270
250	16	1	*	190	250	16	1	*	310
300	16	1 1/8	*	210	300	16	1 1/8	*	360

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.123.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.124.1	
WELDING NECK FLANGE	1	76.65.80.404.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.124.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.523.1	
WELDING NECK FLANGE	2	76.65.80.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.523.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.023.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.024.1	
WELDING NECK FLANGE	1	76.65.80.404.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.024.1	

CLASS 33420

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-20	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -300	49.6	49.6	48.1	45.0	42.2	40.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	15	20	25	40	50	80	150	250

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	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	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.

STAINLESS STEEL AISI 316, SOUR	PLANT :	
CLASS NO. : 33420	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* VALVES			
* PIPE			
PIPE PIPE	DN 15-300	ASTM A312-TP316L	
* FLANGES			
BLFL BLIND FLANGE	DN 15-300	ASTM A182-F316	
COFL COVER FLANGE THERMOWELL NOZZLE	---	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			
BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A182-F316/A351-CF8M	
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-300	TRIM: AISI 316(L),PTFE	
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-300	BODY: ASTM A182-F316/A351-CF8M	
CHVF CHECK VALVE FLANGED	DN 15-300	TRIM: AISI 316(L),PTFE	
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A351-CF8M,A182-F316	
GAVF GATE VALVE FLANGED	DN 15- 40	TRIM: AISI 316(L),STELLITE 6	
GLVF GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316	
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	TRIM: AISI 316(L),STELLITE 6	
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M	
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	TRIM: AISI 316	
* 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	
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BOLT: ASTM A193-B7M/A194-2HM	
MTRR METER RUN	DN 15- 40	BODY: AISI 316	
ORFS ORIFICE FLANGE SET	DN 50-300	BOLT: ASTM A193-B7M/A194-2HM	
STBT STUD BOLT WITH NUTS	---	MONEL 400	
STYB STRAINER Y-TYPE	DN 50-300	LJ END FLANGES: ASTM A350-LF2	
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F316	
		ASTM A193-B7M/A194-2HM	
		SIEVE: AISI 316	
		MONEL 400	

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	74.36.33	018.1	026.1	033.1	049.1	057.1	065.1	073.1	083.1	094.1	106.1	118.1
* 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												
BALL VALVE FULL BORE TRUN FLGD	77.03.74					558.1	560.1	562.1	564.1	565.1	566.1	567.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74					058.1	060.1	062.1	064.1	065.1	066.1	067.1
BUTTERFLY VALVE WAFER TYPE	77.58.40								064.1	065.1	066.1	067.1
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
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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							
GLOBE VALVE FLANGED	77.33.03	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
MONOFL SINGLE BLOCK BALL	77.03.90	123.1	124.1	125.1	127.1	128.1						
* 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	76.64.96	062.1	064.1	066.1	068.1							
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	76.81.71.062.1	450	76.81.71.562.1
840	76.81.71.064.1	840	76.81.71.564.1
1230	76.81.71.066.1	1230	76.81.71.566.1
LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.462.1	230	76.83.37.121.1
813	76.80.61.464.1	255	76.83.37.122.1
1219	76.80.61.466.1	305	76.83.37.123.1
1524	76.80.61.468.1	355	76.83.37.125.1
1829	76.80.61.470.1	405	76.83.37.126.1
2134	76.80.61.472.1	455	76.83.37.127.1
2438	76.80.61.474.1		
2743	76.80.61.476.1		
3048	76.80.61.478.1		

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
					20	4	5/8	*	80
					25	4	5/8	*	80
					40	4	3/4	*	90
					50	8	5/8	*	90
80	8	3/4	*	100	80	8	3/4	*	110
100	8	3/4	*	100	100	8	3/4	*	120
150	12	3/4	*	110	150	12	3/4	*	130
200	12	7/8	*	130	200	12	7/8	*	140
250	16	1	*	140	250	16	1	*	160
300	16	1 1/8	*	160	300	16	1 1/8	*	170

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	*	70					
20	4	5/8	*	80					
25	4	5/8	*	90					
40	4	3/4	*	100					
					50	8	5/8	*	150
					80	8	3/4	*	150
					100	12	3/4	*	140
					150	12	3/4	*	140
					200	12	7/8	*	150
					250	16	1	*	170
					300	16	1 1/8	*	190

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	*	100	50	8	5/8	*	160
80	8	3/4	*	120	80	8	3/4	*	190
100	8	3/4	*	130	100	8	3/4	*	190
150	12	3/4	*	150	150	12	3/4	*	230
200	12	7/8	*	170	200	12	7/8	*	270
250	16	1	*	190	250	16	1	*	310
300	16	1 1/8	*	210	300	16	1 1/8	*	360

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.123.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.124.1	
WELDING NECK FLANGE	1	76.65.80.404.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.124.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.523.1	
WELDING NECK FLANGE	2	76.65.80.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.523.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
* 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	76.83.37.121.1	
* 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	81.38.66.330.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.023.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.024.1	
WELDING NECK FLANGE	1	76.65.80.404.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.024.1	

CLASS 33430

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	-20	0	50	75	100	120	150	200

	PRESSURE BAR GA							
DN15 -300	49.6	49.6	48.1	45.0	42.2	40.7	38.5	35.7

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

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	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	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	40S
200	40S
250	40S
300	40S

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.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 33430	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-300	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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

		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
* 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
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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	76.64.96	062.1	064.1	066.1	068.1							
ORIFICE FLANGE SET	76.65.92					470.1	472.1	264.1	416.1	418.1	420.1	422.1

	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	76.83.37.121.1
813	76.80.61.464.1	255	76.83.37.122.1
1219	76.80.61.466.1	305	76.83.37.123.1
1524	76.80.61.468.1	355	76.83.37.125.1
1829	76.80.61.470.1	405	76.83.37.126.1
2134	76.80.61.472.1	455	76.83.37.127.1
2438	76.80.61.474.1		
2743	76.80.61.476.1		
3048	76.80.61.478.1		

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
20	4	5/8	*	80	61.269.1	20	4	5/8	*	80
25	4	5/8	*	80	61.269.1	25	4	5/8	*	90
40	4	3/4	*	90	61.327.1	40	4	3/4	*	100
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 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

DN NR INCH * MM 81.38

50	8	5/8	*	160	61.296.1
80	8	3/4	*	190	61.343.1
100	8	3/4	*	190	61.343.1
150	12	3/4	*	230	61.349.1
200	12	7/8	*	270	61.425.1
250	16	1	*	310	61.496.1
300	16	1 1/8	*	360	61.562.1

ASSEMBLIES

```

* DRAIN POINT DN 15 FIG.01 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.01   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 -600
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.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  77.23.03.053.1
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
WELDING NECK FLANGE           2  76.65.80.402.1

```

```

* PRESSURE INSTR.CONN.      DN 15  FIG.OI      DN 15 - 40
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
                                4  81.38.61.155.1
WELDING NECK FLANGE           1  76.65.80.402.1

```

```

* PRESSURE INSTR.CONN.      DN 15  FIG.01      DN 50 -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  77.23.03.053.1
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  76.65.80.402.1

```

```
* 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    85.30.01.104.1
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
                                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   76.83.37.121.1

```

```

* 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   76.83.37.122.1

```

```

* 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

```

CLASS 33450

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-100	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -300	49.6	49.6	48.1	45.0	42.2	40.7

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	15	20	25	40	50	80	150	250

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	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	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.

STAINLESS STEEL LOW TEMP.	PLANT :	
CLASS NO. : 33450	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	---	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-300	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),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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 A320-L7/A194-4
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A320-L7/A194-4
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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ISSUE DATE : DECEMBER 1998

		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
* 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												
BALL VALVE FULL BORE TRUN FLGD	77.03.73					558.1	560.1	562.1	564.1	565.1	566.1	567.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73					058.1	060.1	062.1	064.1	065.1	066.1	067.1
BUTTERFLY VALVE WAFER TYPE	77.58.41								064.1	065.1	066.1	067.1
CHECK VALVE FLANGED	77.13.19	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED	77.23.05	053.1	054.1	055.1	057.1							
GLOBE VALVE FLANGED	77.33.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
MONOFL SINGLE BLOCK BALL	77.03.90	023.1	024.1	025.1	027.1	028.1						
* 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	76.64.96	012.1	014.1	016.1	018.1							
ORIFICE FLANGE SET	76.65.92					470.1	472.1	264.1	416.1	418.1	420.1	422.1

	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	76.81.72.062.1	450	76.81.72.562.1
840	76.81.72.064.1	840	76.81.72.564.1
1230	76.81.72.066.1	1230	76.81.72.566.1
LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
----	-----	-----	-----
356	76.80.61.462.1	230	76.83.37.121.1
813	76.80.61.464.1	255	76.83.37.122.1
1219	76.80.61.466.1	305	76.83.37.123.1
1524	76.80.61.468.1	355	76.83.37.125.1
1829	76.80.61.470.1	405	76.83.37.126.1
2134	76.80.61.472.1	455	76.83.37.127.1
2438	76.80.61.474.1		
2743	76.80.61.476.1		
3048	76.80.61.478.1		

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
					20	4	5/8	*	80
					25	4	5/8	*	80
					40	4	3/4	*	90
					50	8	5/8	*	90
80	8	3/4	*	100	80	8	3/4	*	110
100	8	3/4	*	100	100	8	3/4	*	120
150	12	3/4	*	110	150	12	3/4	*	130
200	12	7/8	*	130	200	12	7/8	*	140
250	16	1	*	140	250	16	1	*	160
300	16	1 1/8	*	160	300	16	1 1/8	*	170

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	*	70					
20	4	5/8	*	80					
25	4	5/8	*	90					
40	4	3/4	*	100					
					50	8	5/8	*	150
					80	8	3/4	*	150
					100	12	3/4	*	140
					150	12	3/4	*	140
					200	12	7/8	*	150
					250	16	1	*	170
					300	16	1 1/8	*	190

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	*	100	50	8	5/8	*	160
80	8	3/4	*	120	80	8	3/4	*	190
100	8	3/4	*	130	100	8	3/4	*	190
150	12	3/4	*	150	150	12	3/4	*	230
200	12	7/8	*	170	200	12	7/8	*	270
250	16	1	*	190	250	16	1	*	310
300	16	1 1/8	*	210	300	16	1 1/8	*	360

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.023.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.024.1	
WELDING NECK FLANGE	1	76.65.80.404.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.024.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.423.1	
WELDING NECK FLANGE	2	76.65.80.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.423.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.423.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.423.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.423.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.423.1	
* 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	76.65.60.783.1	
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	76.83.37.121.1	
* 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	76.65.60.783.1	
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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.92.023.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.92.024.1	
WELDING NECK FLANGE	1	76.65.80.404.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.92.024.1	

CLASS 33460

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-73	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -300	49.6	49.6	48.1	45.0	42.2	40.7

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	15	20	25	40	50	80	150	250

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	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	40S
200	40S
250	40S
300	40S

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.

STAINLESS STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 33460	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-300	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	---	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L),PTFE
BUVW	BUTTERFLY VALVE WAFER TYPE	DN150-300	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L),STELLITE 6
CHVF	CHECK VALVE FLANGED	DN 15-300	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),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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 A320-L7M/A194-7M
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

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	74.36.33	018.1	026.1	033.1	049.1	057.1	065.1	073.1	083.1	094.1	106.1	118.1
* 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												
BALL VALVE FULL BORE TRUN FLGD	77.03.73					558.1	560.1	562.1	564.1	565.1	566.1	567.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73					058.1	060.1	062.1	064.1	065.1	066.1	067.1
BUTTERFLY VALVE WAFER TYPE	77.58.41								064.1	065.1	066.1	067.1
CHECK VALVE FLANGED	77.13.19	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1	066.1	067.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					058.1	060.1	062.1	064.1	065.1	066.1	067.1
GATE VALVE FLANGED	77.23.05	053.1	054.1	055.1	057.1							
GLOBE VALVE FLANGED	77.33.05	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1		
MONOFL SINGLE BLOCK BALL	77.03.90	123.1	124.1	125.1	127.1	128.1						
* 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	76.64.96	012.1	014.1	016.1	018.1							
ORIFICE FLANGE SET	76.65.92					470.1	472.1	264.1	416.1	418.1	420.1	422.1

	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	76.81.73.062.1	450	76.81.73.562.1
840	76.81.73.064.1	840	76.81.73.564.1
1230	76.81.73.066.1	1230	76.81.73.566.1
LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.462.1	230	76.83.37.121.1
813	76.80.61.464.1	255	76.83.37.122.1
1219	76.80.61.466.1	305	76.83.37.123.1
1524	76.80.61.468.1	355	76.83.37.125.1
1829	76.80.61.470.1	405	76.83.37.126.1
2134	76.80.61.472.1	455	76.83.37.127.1
2438	76.80.61.474.1		
2743	76.80.61.476.1		
3048	76.80.61.478.1		

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
					20	4	5/8	*	80
					25	4	5/8	*	80
					40	4	3/4	*	90
					50	8	5/8	*	90
80	8	3/4	*	100	80	8	3/4	*	110
100	8	3/4	*	100	100	8	3/4	*	120
150	12	3/4	*	110	150	12	3/4	*	130
200	12	7/8	*	130	200	12	7/8	*	140
250	16	1	*	140	250	16	1	*	160
300	16	1 1/8	*	160	300	16	1 1/8	*	170

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	*	70					
20	4	5/8	*	80					
25	4	5/8	*	90					
40	4	3/4	*	100					
					50	8	5/8	*	150
					80	8	3/4	*	150
					100	12	3/4	*	140
					150	12	3/4	*	140
					200	12	7/8	*	150
					250	16	1	*	170
					300	16	1 1/8	*	190

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	*	100	50	8	5/8	*	160
80	8	3/4	*	120	80	8	3/4	*	190
100	8	3/4	*	130	100	8	3/4	*	190
150	12	3/4	*	150	150	12	3/4	*	230
200	12	7/8	*	170	200	12	7/8	*	270
250	16	1	*	190	250	16	1	*	310
300	16	1 1/8	*	210	300	16	1 1/8	*	360

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.123.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.124.1	
WELDING NECK FLANGE	1	76.65.80.404.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.124.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.523.1	
WELDING NECK FLANGE	2	76.65.80.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.523.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.523.1	
* 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	76.65.60.783.1	
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	76.83.37.121.1	
* 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	76.65.60.783.1	
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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.023.1	
WELDING NECK FLANGE	1	76.65.80.402.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.024.1	
WELDING NECK FLANGE	1	76.65.80.404.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.024.1	

CLASS 33831

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-20	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	51.7	51.7	51.2	50.3	49.1	47.8

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
- FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST
- WHERE TWO OPTIONS ARE GIVEN FOR PIPE, WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

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	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	B	B	B	B	B	A			25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	E	B	B	A						100	10S
200	C	C	C	C	E	E	E	B	B	A							150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	C	B	B	A										250	10S
80	C	C	C	B	B	A											300	20
50	C	B	B	B	A												350	20
40	B	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
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803	PLANT :	
CLASS NO. : 33831	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN150-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, PTFE
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, STELLITE 6
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKTI GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
STYB STRAINER Y-TYPE	DN 50-400	SIEVE: ASTM A240 UNS S31803
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57								143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
PIPE	74.36.58	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1								
* FLANGES																	
BLIND FLANGE	76.66.01	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
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	292.1	294.1	296.1	298.1	300.1	302.1	304.1	306.1	308.1	310.1	312.1	314.1	316.1	318.1	320.1	322.1
WELDING NECK FLANGE	76.66.29	234.1	236.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	286.1	288.1	290.1	292.1	294.1	296.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.58.09								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.13.41	053.1	054.1	055.1	057.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.23.41	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED	77.33.41	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.03.92	423.1	424.1	425.1	427.1	428.1											
* 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	632.1	634.1	636.1	638.1												
ORIFICE FLANGE SET	76.66.90					586.1	588.1	506.1	508.1	510.1	512.1	530.1	532.1	534.1	536.1	538.1	540.1
STRAINER Y-TYPE	76.83.21					852.1	854.1	856.1	858.1	860.1	862.1	864.1	866.1	868.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.48.828.1			
25* 15		36.43.025.1	36.58.025.1	36.83.025.1	400* 80	78.48.848.1			
25* 20		36.43.041.1	36.58.041.1	36.83.041.1	400*100	78.48.868.1			
40* 15		36.43.057.1	36.58.057.1	36.83.057.1	400*150	78.48.888.1			
40* 20		36.43.075.1	36.58.075.1	36.83.075.1	400*200		36.43.639.1	36.58.639.1	36.83.639.1
40* 25		36.43.086.1	36.58.086.1	36.83.086.1	400*250		36.43.659.1	36.58.659.1	36.83.657.1
50* 20		36.43.107.1	36.58.107.1	36.83.107.1	400*300		36.43.666.1	36.58.666.1	36.83.666.1
50* 25		36.43.120.1	36.58.120.1	36.83.120.1	400*350		36.43.684.1	36.58.684.1	36.83.684.1
50* 40		36.43.136.1	36.58.136.1	36.83.136.1	450* 50	78.48.830.1			
80* 40		36.43.152.1	36.58.152.1	36.83.152.1	450* 80	78.48.850.1			
80* 50		36.43.170.1	36.58.170.1	36.83.170.1	450*100	78.48.870.1			
100* 40		36.43.186.1	36.58.186.1	36.83.186.1	450*150	78.48.890.1			
100* 50		36.43.205.1	36.58.205.1	36.83.205.1	450*200			36.83.708.1	
100* 80		36.43.224.1	36.58.224.1	36.83.224.1	450*250		36.43.729.1	36.58.729.1	36.83.723.1
150* 50	78.48.364.1				450*300		36.43.732.1	36.58.732.1	36.83.732.1
150* 80		36.43.243.1	36.58.243.1	36.83.243.1	450*350		36.43.750.1	36.58.750.1	36.83.750.1
150*100		36.43.260.1	36.58.260.1	36.83.260.1	450*400		36.43.767.1	36.58.767.1	36.83.767.1
200* 50	78.48.366.1				500* 50	78.48.832.1			
200* 80	78.48.390.1				500* 80	78.48.852.1			
200*100		36.43.280.1	36.58.280.1	36.83.280.1	500*100	78.48.872.1			
200*150		36.43.304.1	36.58.304.1	36.83.304.1	500*150	78.48.892.1			
250* 50	78.48.368.1				500*200	78.48.910.1			
250* 80	78.48.392.1				500*250			36.83.809.1	
250*100	78.48.414.1				500*300		36.43.817.1	36.58.817.1	36.83.817.1
250*150		36.43.351.1	36.58.351.1	36.83.351.1	500*350		36.43.835.1	36.58.835.1	36.83.835.1
250*200		36.43.374.1	36.58.374.1	36.83.374.1	500*400		36.43.852.1	36.58.852.1	36.83.852.1
300* 50	78.48.824.1				500*450		36.43.869.1	36.58.869.1	36.83.869.1
300* 80	78.48.844.1				600* 50	78.48.836.1			
300*100	78.48.864.1				600* 80	78.48.856.1			
300*150		36.43.420.1	36.58.420.1	36.83.419.1	600*100	78.48.876.1			
300*200		36.43.447.1	36.58.447.1	36.83.447.1	600*150	78.48.896.1			
300*250		36.43.474.1	36.58.474.1	36.83.481.1	600*200	78.48.914.1			
350* 50	78.48.826.1				600*250	78.49.030.1			
350* 80	78.48.846.1				600*300			36.83.902.1	
350*100	78.48.866.1				600*350			36.83.923.1	
350*150		36.43.515.1	36.58.515.1	36.83.514.1	600*400		36.43.943.1	36.58.943.1	36.83.943.1
350*200		36.43.541.1	36.58.541.1	36.83.542.1	600*450		36.43.963.1	36.58.963.1	36.83.963.1
350*250		36.43.575.1	36.58.575.1	36.83.575.1	600*500		36.43.983.1	36.58.983.1	36.83.983.1
350*300		36.43.597.1	36.58.597.1	36.83.597.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
15	40-150	241.1	241.1
	200-600	242.1	242.1
20	40- 80	243.1	243.1
	100-600	244.1	244.1
25	40- 40	265.1	255.1
	50- 50	266.1	256.1
	80-100	267.1	257.1
	150-600	268.1	258.1
40	50- 50	270.1	259.1
	80- 80	271.1	260.1
	100-100	272.1	261.1
	150-300	273.1	262.1
	350-600	274.1	263.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450	76.81.73.012.1
840	76.81.73.014.1
1230	76.81.73.016.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356	76.80.62.422.1
813	76.80.62.424.1
1219	76.80.62.426.1
1524	76.80.62.428.1
1829	76.80.62.430.1
2134	76.80.62.432.1
2438	76.80.62.434.1
2743	76.80.62.436.1
3048	76.80.62.438.1

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	61.155.1
					20	4	5/8	* 80	61.269.1
					25	4	5/8	* 80	61.269.1
					40	4	3/4	* 90	61.327.1
					50	8	5/8	* 90	61.271.1
80	8	3/4	* 100	61.329.1	80	8	3/4	* 110	61.330.1
100	8	3/4	* 100	61.329.1	100	8	3/4	* 120	61.332.1
150	12	3/4	* 110	61.330.1	150	12	3/4	* 130	61.334.1
200	12	7/8	* 130	61.403.1	200	12	7/8	* 140	61.404.1
250	16	1	* 140	61.469.1	250	16	1	* 160	61.472.1
300	16	1 1/8	* 160	61.530.1	300	16	1 1/8	* 170	61.532.1
350	20	1 1/8	* 180	61.533.1	350	20	1 1/8	* 180	61.533.1
400	24	1 1/4	* 210	61.595.1	400	20	1 1/4	* 190	61.592.1
450	24	1 1/4	* 220	61.597.1	450	24	1 1/4	* 200	61.588.1
500	24	1 1/4	* 230	61.598.1	500	24	1 1/4	* 210	61.595.1
600	24	1 1/2	* 270	61.682.1	600	24	1 1/2	* 240	61.687.1

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	5/8	* 80	61.269.1					
25	4	5/8	* 90	61.271.1					
40	4	3/4	* 100	61.329.1					
					50	8	5/8	* 150	61.281.1
					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	* 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	* 100	61.273.1	50	8	5/8	* 160	61.296.1
80	8	3/4	* 120	61.332.1	80	8	3/4	* 190	61.343.1
100	8	3/4	* 130	61.334.1	100	8	3/4	* 190	61.343.1
150	12	3/4	* 150	61.337.1	150	12	3/4	* 230	61.349.1
200	12	7/8	* 170	61.409.1	200	12	7/8	* 270	61.425.1
250	16	1	* 190	61.477.1	250	16	1	* 310	61.496.1
300	16	1 1/8	* 210	61.538.1	300	16	1 1/8	* 360	61.562.1
350	20	1 1/8	* 220	61.540.1	350	20	1 1/8	* 410	61.570.1
400	20	1 1/4	* 240	61.600.1	400	20	1 1/4	* 440	61.630.1
450	24	1 1/4	* 250	61.586.1	450	24	1 1/4	* 470	61.634.1
500	24	1 1/4	* 260	61.603.1	500	24	1 1/4	* 510	83.142.1
600	24	1 1/2	* 300	61.696.1	600	24	1 1/2	* 570	83.288.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.042.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.423.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.424.1	
WELDING NECK FLANGE	1	76.66.29.236.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.823.1	
WELDING NECK FLANGE	2	76.66.29.234.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.823.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
* 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	76.65.61.014.1	
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	76.83.36.251.1	
* 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	76.65.61.014.1	
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	76.83.36.252.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.042.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.023.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.024.1	
WELDING NECK FLANGE	1	76.66.29.236.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.024.1	

CLASS 33832

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-20	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	51.7	51.7	51.2	50.3	49.1	47.8

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - WHERE TWO OPTIONS ARE GIVEN FOR PIPE, WELDED PIPE IS NORMALLY THE MOST ECONOMIC CHOICE

BRANCH CONNECTIONS 90 DEGREES

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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	10S
300	C	C	C	C	E	E	E	B	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	B	B	B	A						100	10S
200	C	C	C	C	E	E	B	B	B	A							150	10S
150	C	C	C	C	E	B	B	B	A								200	10S
100	C	C	C	C	B	B	B	A									250	10S
80	C	C	C	B	B	B	A										300	20
50	C	B	B	B	B	A											350	20
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, SOUR	PLANT :	
CLASS NO. : 33832	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 33832, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN150-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, PTFE
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, STELLITE 6
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKTI GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
STYB STRAINER Y-TYPE	DN 50-400	SIEVE: ASTM A240 UNS S31803
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57								143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
PIPE	74.36.58	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1								
* FLANGES																	
BLIND FLANGE	76.66.01	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
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	292.1	294.1	296.1	298.1	300.1	302.1	304.1	306.1	308.1	310.1	312.1	314.1	316.1	318.1	320.1	322.1
WELDING NECK FLANGE	76.66.29	234.1	236.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	286.1	288.1	290.1	292.1	294.1	296.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.58.09								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.13.41	053.1	054.1	055.1	057.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.23.41	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED	77.33.41	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.03.92	423.1	424.1	425.1	427.1	428.1											
* 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	632.1	634.1	636.1	638.1												
ORIFICE FLANGE SET	76.66.90					586.1	588.1	506.1	508.1	510.1	512.1	530.1	532.1	534.1	536.1	538.1	540.1
STRAINER Y-TYPE	76.83.21					852.1	854.1	856.1	858.1	860.1	862.1	864.1	866.1	868.1			

BROB	RECB	REEB	TERB	BROB	RECB	REEB	TERB
76.	76.	76.	76.	76.	76.	76.	76.
RUN* BR							
20* 15	36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.48.828.1		
25* 15	36.43.025.1	36.58.025.1	36.83.025.1	400* 80	78.48.848.1		
25* 20	36.43.041.1	36.58.041.1	36.83.041.1	400*100	78.48.868.1		
40* 15	36.43.057.1	36.58.057.1	36.83.057.1	400*150	78.48.888.1		
40* 20	36.43.075.1	36.58.075.1	36.83.075.1	400*200		36.43.639.1	36.58.639.1 36.83.639.1
40* 25	36.43.086.1	36.58.086.1	36.83.086.1	400*250		36.43.659.1	36.58.659.1 36.83.657.1
50* 20	36.43.107.1	36.58.107.1	36.83.107.1	400*300		36.43.666.1	36.58.666.1 36.83.666.1
50* 25	36.43.120.1	36.58.120.1	36.83.120.1	400*350		36.43.684.1	36.58.684.1 36.83.684.1
50* 40	36.43.136.1	36.58.136.1	36.83.136.1	450* 50	78.48.830.1		
80* 40	36.43.152.1	36.58.152.1	36.83.152.1	450* 80	78.48.850.1		
80* 50	36.43.170.1	36.58.170.1	36.83.170.1	450*100	78.48.870.1		
100* 40	36.43.186.1	36.58.186.1	36.83.186.1	450*150	78.48.890.1		
100* 50	36.43.205.1	36.58.205.1	36.83.205.1	450*200			36.83.708.1
100* 80	36.43.224.1	36.58.224.1	36.83.224.1	450*250		36.43.729.1	36.58.729.1 36.83.723.1
150* 50	78.48.364.1			450*300		36.43.732.1	36.58.732.1 36.83.732.1
150* 80		36.43.243.1	36.58.243.1	450*350		36.43.750.1	36.58.750.1 36.83.750.1
150*100		36.43.260.1	36.58.260.1	450*400		36.43.767.1	36.58.767.1 36.83.767.1
200* 50	78.48.366.1			500* 50	78.48.832.1		
200* 80	78.48.390.1			500* 80	78.48.852.1		
200*100		36.43.280.1	36.58.280.1	500*100	78.48.872.1		
200*150		36.43.304.1	36.58.304.1	500*150	78.48.892.1		
250* 50	78.48.368.1			500*200	78.48.910.1		
250* 80	78.48.392.1			500*250			36.83.809.1
250*100	78.48.414.1			500*300		36.43.817.1	36.58.817.1 36.83.817.1
250*150		36.43.351.1	36.58.351.1	500*350		36.43.835.1	36.58.835.1 36.83.835.1
250*200		36.43.374.1	36.58.374.1	500*400		36.43.852.1	36.58.852.1 36.83.852.1
300* 50	78.48.824.1			500*450		36.43.869.1	36.58.869.1 36.83.869.1
300* 80	78.48.844.1			600* 50	78.48.836.1		
300*100	78.48.864.1			600* 80	78.48.856.1		
300*150		36.43.420.1	36.58.420.1	600*100	78.48.876.1		
300*200		36.43.447.1	36.58.447.1	600*150	78.48.896.1		
300*250		36.43.474.1	36.58.474.1	600*200	78.48.914.1		
350* 50	78.48.826.1			600*250	78.49.030.1		
350* 80	78.48.846.1			600*300			36.83.902.1
350*100	78.48.866.1			600*350			36.83.923.1
350*150		36.43.515.1	36.58.515.1	600*400		36.43.943.1	36.58.943.1 36.83.943.1
350*200		36.43.541.1	36.58.541.1	600*450		36.43.963.1	36.58.963.1 36.83.963.1
350*250		36.43.575.1	36.58.575.1	600*500		36.43.983.1	36.58.983.1 36.83.983.1
350*300		36.43.597.1	36.58.597.1				

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.35	76.80.34
15	40-150	241.1	241.1
	200-600	242.1	242.1
20	40- 80	243.1	243.1
	100-600	244.1	244.1
25	40- 40	265.1	255.1
	50- 50	266.1	256.1
	80-100	267.1	257.1
	150-600	268.1	258.1
40	50- 50	270.1	259.1
	80- 80	271.1	260.1
	100-100	272.1	261.1
	150-300	273.1	262.1
	350-600	274.1	263.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450 76.81.73.012.1	450 76.81.73.512.1
840 76.81.73.014.1	840 76.81.73.514.1
1230 76.81.73.016.1	1230 76.81.73.516.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356 76.80.62.422.1	230 76.83.36.251.1
813 76.80.62.424.1	255 76.83.36.252.1
1219 76.80.62.426.1	305 76.83.36.253.1
1524 76.80.62.428.1	355 76.83.36.255.1
1829 76.80.62.430.1	405 76.83.36.256.1
2134 76.80.62.432.1	455 76.83.36.257.1
2438 76.80.62.434.1	
2743 76.80.62.436.1	
3048 76.80.62.438.1	

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
-----				-----			
				15	4	1/2	* 70
				20	4	5/8	* 80
				25	4	5/8	* 80
				40	4	3/4	* 90
				50	8	5/8	* 90
80	8	3/4	* 100	80	8	3/4	* 110
100	8	3/4	* 100	100	8	3/4	* 120
150	12	3/4	* 110	150	12	3/4	* 130
200	12	7/8	* 130	200	12	7/8	* 140
250	16	1	* 140	250	16	1	* 160
300	16	1 1/8	* 160	300	16	1 1/8	* 170
350	20	1 1/8	* 180	350	20	1 1/8	* 180
400	24	1 1/4	* 210	400	20	1 1/4	* 190
450	24	1 1/4	* 220	450	24	1 1/4	* 200
500	24	1 1/4	* 230	500	24	1 1/4	* 210
600	24	1 1/2	* 270	600	24	1 1/2	* 240

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	* 100	50	8	5/8	* 160
80	8	3/4	* 120	80	8	3/4	* 190
100	8	3/4	* 130	100	8	3/4	* 190
150	12	3/4	* 150	150	12	3/4	* 230
200	12	7/8	* 170	200	12	7/8	* 270
250	16	1	* 190	250	16	1	* 310
300	16	1 1/8	* 210	300	16	1 1/8	* 360
350	20	1 1/8	* 220	350	20	1 1/8	* 410
400	20	1 1/4	* 240	400	20	1 1/4	* 440
450	24	1 1/4	* 250	450	24	1 1/4	* 470
500	24	1 1/4	* 260	500	24	1 1/4	* 510
600	24	1 1/2	* 300	600	24	1 1/2	* 570

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.042.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.423.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.424.1	
WELDING NECK FLANGE	1	76.66.29.236.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.823.1	
WELDING NECK FLANGE	2	76.66.29.234.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.823.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
* 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	76.65.61.014.1	
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	76.83.36.251.1
* 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	76.65.61.014.1	
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	76.83.36.252.1
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.042.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.023.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.024.1	
WELDING NECK FLANGE	1	76.66.29.236.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.024.1	

CLASS 33833

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-50	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	51.7	51.7	51.2	50.3	49.1	47.8

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST
 - WHERE TWO OPTIONS ARE GIVEN FOR PIPE, 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	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	B	B	B	B	B	B	A		25	10S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	10S
350	C	C	C	C	E	E	E	E	B	B	B	A					50	10S
300	C	C	C	C	E	E	E	E	B	B	B	A					80	10S
250	C	C	C	C	E	E	E	E	B	B	A						100	10S
200	C	C	C	C	E	E	E	B	B	A							150	10S
150	C	C	C	C	E	B	B	A									200	10S
100	C	C	C	B	B	B	A										250	10S
80	C	C	C	B	B	A											300	20
50	C	B	B	B	A												350	20
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, LOW TEMP	PLANT :	
CLASS NO. : 33833	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN150-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, PTFE
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, STELLITE 6
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKTI GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
STYB STRAINER Y-TYPE	DN 50-400	SIEVE: ASTM A240 UNS S31803
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57								143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1	
PIPE	74.36.58	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1									
* FLANGES																		
BLIND FLANGE	76.66.01	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	
SPECTACLE BLIND FLANGE	76.88.24	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	
SPADE BLIND	76.88.41	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)	76.88.23	292.1	294.1	296.1	298.1	300.1	302.1	304.1	306.1	308.1	310.1	312.1	314.1	316.1	318.1	320.1	322.1	
WELDING NECK FLANGE	76.66.29	234.1	236.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	286.1	288.1	290.1	292.1	294.1	296.1	
* FITTINGS																		
CAP BUTT-WELD.END	76.36.05	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1	
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1	
* VALVES																		
BALL VALVE FULL BORE TRUN FLGD	77.03.81					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1	
BALL VALVE RED. BORE TRUN FLGD	77.03.81					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1	
BUTTERFLY VALVE WAFER TYPE	77.58.09								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1	
CHECK VALVE FLANGED	77.13.41	053.1	054.1	055.1	057.1													
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.23.41	053.1	054.1	055.1	057.1													
GLOBE VALVE FLANGED	77.33.41	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1								
MONOFL SINGLE BLOCK BALL	77.03.92	423.1	424.1	425.1	427.1	428.1												
* 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	632.1	634.1	636.1	638.1													
ORIFICE FLANGE SET	76.66.90					586.1	588.1	506.1	508.1	510.1	512.1	530.1	532.1	534.1	536.1	538.1	540.1	
STRAINER Y-TYPE	76.83.21					852.1	854.1	856.1	858.1	860.1	862.1	864.1	866.1	868.1				

BROB	RECB	REEB	TERB	BROB	RECB	REEB	TERB
76.	76.	76.	76.	76.	76.	76.	76.
RUN* BR							
20* 15	36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.48.828.1		
25* 15	36.43.025.1	36.58.025.1	36.83.025.1	400* 80	78.48.848.1		
25* 20	36.43.041.1	36.58.041.1	36.83.041.1	400*100	78.48.868.1		
40* 15	36.43.057.1	36.58.057.1	36.83.057.1	400*150	78.48.888.1		
40* 20	36.43.075.1	36.58.075.1	36.83.075.1	400*200		36.43.639.1	36.58.639.1 36.83.639.1
40* 25	36.43.086.1	36.58.086.1	36.83.086.1	400*250		36.43.659.1	36.58.659.1 36.83.657.1
50* 20	36.43.107.1	36.58.107.1	36.83.107.1	400*300		36.43.666.1	36.58.666.1 36.83.666.1
50* 25	36.43.120.1	36.58.120.1	36.83.120.1	400*350		36.43.684.1	36.58.684.1 36.83.684.1
50* 40	36.43.136.1	36.58.136.1	36.83.136.1	450* 50	78.48.830.1		
80* 40	36.43.152.1	36.58.152.1	36.83.152.1	450* 80	78.48.850.1		
80* 50	36.43.170.1	36.58.170.1	36.83.170.1	450*100	78.48.870.1		
100* 40	36.43.186.1	36.58.186.1	36.83.186.1	450*150	78.48.890.1		
100* 50	36.43.205.1	36.58.205.1	36.83.205.1	450*200			36.83.708.1
100* 80	36.43.224.1	36.58.224.1	36.83.224.1	450*250		36.43.729.1	36.58.729.1 36.83.723.1
150* 50	78.48.364.1			450*300		36.43.732.1	36.58.732.1 36.83.732.1
150* 80		36.43.243.1	36.58.243.1	450*350		36.43.750.1	36.58.750.1 36.83.750.1
150*100		36.43.260.1	36.58.260.1	450*400		36.43.767.1	36.58.767.1 36.83.767.1
200* 50	78.48.366.1			500* 50	78.48.832.1		
200* 80	78.48.390.1			500* 80	78.48.852.1		
200*100		36.43.280.1	36.58.280.1	500*100	78.48.872.1		
200*150		36.43.304.1	36.58.304.1	500*150	78.48.892.1		
250* 50	78.48.368.1			500*200	78.48.910.1		
250* 80	78.48.392.1			500*250			36.83.809.1
250*100	78.48.414.1			500*300		36.43.817.1	36.58.817.1 36.83.817.1
250*150		36.43.351.1	36.58.351.1	500*350		36.43.835.1	36.58.835.1 36.83.835.1
250*200		36.43.374.1	36.58.374.1	500*400		36.43.852.1	36.58.852.1 36.83.852.1
300* 50	78.48.824.1			500*450		36.43.869.1	36.58.869.1 36.83.869.1
300* 80	78.48.844.1			600* 50	78.48.836.1		
300*100	78.48.864.1			600* 80	78.48.856.1		
300*150		36.43.420.1	36.58.420.1	600*100	78.48.876.1		
300*200		36.43.447.1	36.58.447.1	600*150	78.48.896.1		
300*250		36.43.474.1	36.58.474.1	600*200	78.48.914.1		
350* 50	78.48.826.1			600*250	78.49.030.1		
350* 80	78.48.846.1			600*300			36.83.902.1
350*100	78.48.866.1			600*350			36.83.923.1
350*150		36.43.515.1	36.58.515.1	600*400		36.43.943.1	36.58.943.1 36.83.943.1
350*200		36.43.541.1	36.58.541.1	600*450		36.43.963.1	36.58.963.1 36.83.963.1
350*250		36.43.575.1	36.58.575.1	600*500		36.43.983.1	36.58.983.1 36.83.983.1
350*300		36.43.597.1	36.58.597.1				

BRANCH	RUN-PIPE	BNIF	BNIP
		76.80.35	76.80.34
15	40-150	241.1	241.1
	200-600	242.1	242.1
20	40- 80	243.1	243.1
	100-600	244.1	244.1
25	40- 40	265.1	255.1
	50- 50	266.1	256.1
	80-100	267.1	257.1
	150-600	268.1	258.1
40	50- 50	270.1	259.1
	80- 80	271.1	260.1
	100-100	272.1	261.1
	150-300	273.1	262.1
	350-600	274.1	263.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450 76.81.73.012.1	450 76.81.73.512.1
840 76.81.73.014.1	840 76.81.73.514.1
1230 76.81.73.016.1	1230 76.81.73.516.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356 76.80.62.422.1	230 76.83.36.251.1
813 76.80.62.424.1	255 76.83.36.252.1
1219 76.80.62.426.1	305 76.83.36.253.1
1524 76.80.62.428.1	355 76.83.36.255.1
1829 76.80.62.430.1	405 76.83.36.256.1
2134 76.80.62.432.1	455 76.83.36.257.1
2438 76.80.62.434.1	
2743 76.80.62.436.1	
3048 76.80.62.438.1	

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
-----				-----			
				15	4	1/2	* 70
				20	4	5/8	* 80
				25	4	5/8	* 80
				40	4	3/4	* 90
				50	8	5/8	* 90
80	8	3/4	* 100	80	8	3/4	* 110
100	8	3/4	* 100	100	8	3/4	* 120
150	12	3/4	* 110	150	12	3/4	* 130
200	12	7/8	* 130	200	12	7/8	* 140
250	16	1	* 140	250	16	1	* 160
300	16	1 1/8	* 160	300	16	1 1/8	* 170
350	20	1 1/8	* 180	350	20	1 1/8	* 180
400	24	1 1/4	* 210	400	20	1 1/4	* 190
450	24	1 1/4	* 220	450	24	1 1/4	* 200
500	24	1 1/4	* 230	500	24	1 1/4	* 210
600	24	1 1/2	* 270	600	24	1 1/2	* 240

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	* 100	50	8	5/8	* 160
80	8	3/4	* 120	80	8	3/4	* 190
100	8	3/4	* 130	100	8	3/4	* 190
150	12	3/4	* 150	150	12	3/4	* 230
200	12	7/8	* 170	200	12	7/8	* 270
250	16	1	* 190	250	16	1	* 310
300	16	1 1/8	* 210	300	16	1 1/8	* 360
350	20	1 1/8	* 220	350	20	1 1/8	* 410
400	20	1 1/4	* 240	400	20	1 1/4	* 440
450	24	1 1/4	* 250	450	24	1 1/4	* 470
500	24	1 1/4	* 260	500	24	1 1/4	* 510
600	24	1 1/2	* 300	600	24	1 1/2	* 570

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.042.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.423.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.424.1	
WELDING NECK FLANGE	1	76.66.29.236.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.823.1	
WELDING NECK FLANGE	2	76.66.29.234.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.823.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
* 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	76.65.61.014.1	
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	76.83.36.251.1	
* 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	76.65.61.014.1	
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	76.83.36.252.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.042.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.023.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.024.1	
WELDING NECK FLANGE	1	76.66.29.236.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.024.1	

CLASS 33834

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-50	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	51.7	51.7	51.2	50.3	49.1	47.8

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - WHERE TWO OPTIONS ARE GIVEN FOR PIPE, 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	450	600
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	A
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	A
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A	
400	C	C	C	C	E	E	E	E	B	B	B	B	A		
350	C	C	C	C	E	E	E	B	B	B	B	A			
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	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
200	10S
250	10S
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
 E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, LT SOUR	PLANT :	
CLASS NO. : 33834	CONSIGNEE :	
ANS RATING : CLASS 300	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN150-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, PTFE
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, PTFE
BUVW BUTTERFLY VALVE WAFER TYPE	DN150-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX, STELLITE 6
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-200	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKTI GASKET, RF TANGED INSERT	DN 15-600	GRAPHITE
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
STYB STRAINER Y-TYPE	DN 50-400	SIEVE: ASTM A240 UNS S31803
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57								143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
PIPE	74.36.58	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1								
* FLANGES																	
BLIND FLANGE	76.66.01	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
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	292.1	294.1	296.1	298.1	300.1	302.1	304.1	306.1	308.1	310.1	312.1	314.1	316.1	318.1	320.1	322.1
WELDING NECK FLANGE	76.66.29	234.1	236.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	286.1	288.1	290.1	292.1	294.1	296.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	054.1	074.1	084.1	104.1	124.1	143.1	153.1	166.1	183.1	200.1	215.1	233.1	248.1	263.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					558.1	560.1	562.1	564.1	565.1	566.1	567.1	568.1	569.1	570.1	571.1	573.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					058.1	060.1	062.1	064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
BUTTERFLY VALVE WAFER TYPE	77.58.09								064.1	065.1	066.1	067.1	068.1	069.1	070.1	071.1	073.1
CHECK VALVE FLANGED	77.13.41	053.1	054.1	055.1	057.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.23.41	053.1	054.1	055.1	057.1												
GLOBE VALVE FLANGED	77.33.41	053.1	054.1	055.1	057.1	058.1	060.1	062.1	064.1	065.1							
MONOFL SINGLE BLOCK BALL	77.03.92	423.1	424.1	425.1	427.1	428.1											
* 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	632.1	634.1	636.1	638.1												
ORIFICE FLANGE SET	76.66.90					586.1	588.1	506.1	508.1	510.1	512.1	530.1	532.1	534.1	536.1	538.1	540.1
STRAINER Y-TYPE	76.83.21					852.1	854.1	856.1	858.1	860.1	862.1	864.1	866.1	868.1			

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.48.828.1			
25* 15		36.43.025.1	36.58.025.1	36.83.025.1	400* 80	78.48.848.1			
25* 20		36.43.041.1	36.58.041.1	36.83.041.1	400*100	78.48.868.1			
40* 15		36.43.057.1	36.58.057.1	36.83.057.1	400*150	78.48.888.1			
40* 20		36.43.075.1	36.58.075.1	36.83.075.1	400*200		36.43.639.1	36.58.639.1	36.83.639.1
40* 25		36.43.086.1	36.58.086.1	36.83.086.1	400*250		36.43.659.1	36.58.659.1	36.83.657.1
50* 20		36.43.107.1	36.58.107.1	36.83.107.1	400*300		36.43.666.1	36.58.666.1	36.83.666.1
50* 25		36.43.120.1	36.58.120.1	36.83.120.1	400*350		36.43.684.1	36.58.684.1	36.83.684.1
50* 40		36.43.136.1	36.58.136.1	36.83.136.1	450* 50	78.48.830.1			
80* 40		36.43.152.1	36.58.152.1	36.83.152.1	450* 80	78.48.850.1			
80* 50		36.43.170.1	36.58.170.1	36.83.170.1	450*100	78.48.870.1			
100* 40		36.43.186.1	36.58.186.1	36.83.186.1	450*150	78.48.890.1			
100* 50		36.43.205.1	36.58.205.1	36.83.205.1	450*200			36.83.708.1	
100* 80		36.43.224.1	36.58.224.1	36.83.224.1	450*250		36.43.729.1	36.58.729.1	36.83.723.1
150* 50	78.48.364.1				450*300		36.43.732.1	36.58.732.1	36.83.732.1
150* 80		36.43.243.1	36.58.243.1	36.83.243.1	450*350		36.43.750.1	36.58.750.1	36.83.750.1
150*100		36.43.260.1	36.58.260.1	36.83.260.1	450*400		36.43.767.1	36.58.767.1	36.83.767.1
200* 50	78.48.366.1				500* 50	78.48.832.1			
200* 80	78.48.390.1				500* 80	78.48.852.1			
200*100		36.43.280.1	36.58.280.1	36.83.280.1	500*100	78.48.872.1			
200*150		36.43.304.1	36.58.304.1	36.83.304.1	500*150	78.48.892.1			
250* 50	78.48.368.1				500*200	78.48.910.1			
250* 80	78.48.392.1				500*250			36.83.809.1	
250*100	78.48.414.1				500*300		36.43.817.1	36.58.817.1	36.83.817.1
250*150		36.43.351.1	36.58.351.1	36.83.351.1	500*350		36.43.835.1	36.58.835.1	36.83.835.1
250*200		36.43.374.1	36.58.374.1	36.83.374.1	500*400		36.43.852.1	36.58.852.1	36.83.852.1
300* 50	78.48.824.1				500*450		36.43.869.1	36.58.869.1	36.83.869.1
300* 80	78.48.844.1				600* 50	78.48.836.1			
300*100	78.48.864.1				600* 80	78.48.856.1			
300*150		36.43.420.1	36.58.420.1	36.83.419.1	600*100	78.48.876.1			
300*200		36.43.447.1	36.58.447.1	36.83.447.1	600*150	78.48.896.1			
300*250		36.43.474.1	36.58.474.1	36.83.481.1	600*200	78.48.914.1			
350* 50	78.48.826.1				600*250	78.49.030.1			
350* 80	78.48.846.1				600*300			36.83.902.1	
350*100	78.48.866.1				600*350			36.83.923.1	
350*150		36.43.515.1	36.58.515.1	36.83.514.1	600*400		36.43.943.1	36.58.943.1	36.83.943.1
350*200		36.43.541.1	36.58.541.1	36.83.542.1	600*450		36.43.963.1	36.58.963.1	36.83.963.1
350*250		36.43.575.1	36.58.575.1	36.83.575.1	600*500		36.43.983.1	36.58.983.1	36.83.983.1
350*300		36.43.597.1	36.58.597.1	36.83.597.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
15	40-150	241.1	241.1
	200-600	242.1	242.1
20	40- 80	243.1	243.1
	100-600	244.1	244.1
25	40- 40	265.1	255.1
	50- 50	266.1	256.1
	80-100	267.1	257.1
	150-600	268.1	258.1
40	50- 50	270.1	259.1
	80- 80	271.1	260.1
	100-100	272.1	261.1
	150-300	273.1	262.1
	350-600	274.1	263.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450	76.81.73.012.1
840	76.81.73.014.1
1230	76.81.73.016.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356	76.80.62.422.1
813	76.80.62.424.1
1219	76.80.62.426.1
1524	76.80.62.428.1
1829	76.80.62.430.1
2134	76.80.62.432.1
2438	76.80.62.434.1
2743	76.80.62.436.1
3048	76.80.62.438.1

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 API609 BFLY VALVE

BOLTSET FLANGED JOINTS

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

					15	4	1/2	* 70	67.155.1
					20	4	5/8	* 80	67.269.1
					25	4	5/8	* 80	67.269.1
					40	4	3/4	* 90	67.327.1
					50	8	5/8	* 90	67.271.1
80	8	3/4	* 100	67.329.1	80	8	3/4	* 110	67.330.1
100	8	3/4	* 100	67.329.1	100	8	3/4	* 120	67.332.1
150	12	3/4	* 110	67.330.1	150	12	3/4	* 130	67.334.1
200	12	7/8	* 130	67.403.1	200	12	7/8	* 140	67.404.1
250	16	1	* 140	67.469.1	250	16	1	* 160	67.472.1
300	16	1 1/8	* 160	67.530.1	300	16	1 1/8	* 170	67.532.1
350	20	1 1/8	* 180	67.533.1	350	20	1 1/8	* 180	67.533.1
400	24	1 1/4	* 210	67.595.1	400	20	1 1/4	* 190	67.592.1
450	24	1 1/4	* 220	67.597.1	450	24	1 1/4	* 200	67.588.1
500	24	1 1/4	* 230	67.598.1	500	24	1 1/4	* 210	67.595.1
600	24	1 1/2	* 270	67.691.1	600	24	1 1/2	* 240	67.687.1

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

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

15	4	1/2	* 70	67.155.1					
20	4	5/8	* 80	67.269.1					
25	4	5/8	* 90	67.271.1					
40	4	3/4	* 100	67.329.1					
					50	8	5/8	* 150	67.281.1
					80	8	3/4	* 150	67.337.1
					100	12	3/4	* 140	67.335.1
					150	12	3/4	* 140	67.335.1
					200	12	7/8	* 150	67.406.1
					250	16	1	* 170	67.474.1
					300	16	1 1/8	* 190	67.535.1
					350	20	1 1/8	* 200	67.544.1
					400	20	1 1/4	* 210	67.595.1
					450	24	1 1/4	* 220	67.597.1
					500	24	1 1/4	* 230	67.598.1
					600	24	1 1/2	* 260	67.690.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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

15	4	1/2	* 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	* 100	67.273.1	50	8	5/8	* 160	67.283.1
80	8	3/4	* 120	67.332.1	80	8	3/4	* 190	67.343.1
100	8	3/4	* 130	67.334.1	100	8	3/4	* 190	67.343.1
150	12	3/4	* 150	67.337.1	150	12	3/4	* 230	67.349.1
200	12	7/8	* 170	67.409.1	200	12	7/8	* 270	67.425.1
250	16	1	* 190	67.477.1	250	16	1	* 310	67.496.1
300	16	1 1/8	* 210	67.538.1	300	16	1 1/8	* 360	67.562.1
350	20	1 1/8	* 220	67.540.1	350	20	1 1/8	* 410	67.570.1
400	20	1 1/4	* 240	67.600.1	400	20	1 1/4	* 440	67.630.1
450	24	1 1/4	* 250	67.606.1	450	24	1 1/4	* 470	67.634.1
500	24	1 1/4	* 260	67.603.1	500	24	1 1/4	* 510	67.639.1
600	24	1 1/2	* 300	67.696.1	600	24	1 1/2	* 570	67.712.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.042.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.423.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.424.1	
WELDING NECK FLANGE	1	76.66.29.236.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.424.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.823.1	
WELDING NECK FLANGE	2	76.66.29.234.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.823.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, RF TANGED INSERT	1	85.30.01.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.823.1	
* 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	76.65.61.014.1	
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	76.83.36.251.1	
* 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	76.65.61.014.1	
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	76.83.36.252.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.042.1	
GASKET, RF TANGED INSERT	2	85.30.01.104.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.023.1	
WELDING NECK FLANGE	1	76.66.29.234.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.024.1	
WELDING NECK FLANGE	1	76.66.29.236.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.044.1	
GASKET, RF TANGED INSERT	2	85.30.01.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.024.1	

PIPING CLASSES ASME RATING 600

CLASS 61410

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 102.0 100.0 96.0 92.7 91.9

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.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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 80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20 80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25 80
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40 80
350	C	C	C	C	E	E	E	B	B	B	B	A					50 40
300	C	C	C	C	E	E	E	B	B	B	A						80 40
250	C	C	C	C	E	E	E	B	B	A							100 40
200	C	C	C	C	E	E	B	B	A								150 80
150	C	C	C	C	E	B	B	A									200 80
100	C	C	C	B	B	B	A										250 80
80	C	C	C	B	B	A											300 80
50	C	B	B	B	A												350 80
40	B	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. : 61410	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

API5 PIPE (API 5L-B)	DN 15-350	API 5L-B (SML)
	DN400-450	API 5L-B (WLD)
PIPE PIPE	DN 15-450	ASTM A106-B
	DN500-600	ASTM A333-6

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A105
COFL COVER FLANGE THERMOWELL NOZZLE	---	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 15-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6

* 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 80-450	ASTM A105
	DN500-600	ASTM A350-LF2
RECB REDUCER CONC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
REEB REDUCER ECC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
TERB TEE REDUCING BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6

* VALVES

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
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: AISI 316,STELLITE 6
GAVF GATE VALVE FLANGED	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
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1	219.1	255.1	295.1	341.1	391.1					
	74.13.17													445.1	492.1			
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1			
	74.30.17															214.1	246.1	
* 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	710.1	712.1	714.1	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	055.1	075.1	095.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1			
	76.31.18															399.1	410.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1			
	76.31.38															399.1	410.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1			
	76.31.39															399.1	410.1	
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1			
	76.31.84															400.1	410.1	
* VALVES																		
BALL VALVE FULL BORE TRUN FLGD	77.00.72					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.72					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 FLANGED	77.10.05	103.1	104.1	105.1	107.1													
	77.10.23					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					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													
GLOBE VALVE FLANGED	77.30.05	103.1	104.1	105.1	107.1													
	77.30.23					108.1	110.1	112.1	114.1									
MONOFL SINGLE BLOCK BALL	77.00.95	443.1	444.1	445.1	447.1	448.1												
* 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	76.64.96	072.1	074.1	076.1	078.1													
ORIFICE FLANGE SET	76.62.95					710.1	712.1	714.1	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	79.00.721.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.733.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.744.1			
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		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.722.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.734.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.745.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.01.442.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.00.716.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80		30.72.298.1	30.73.298.1	30.89.182.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100		30.72.308.1	30.73.308.1	30.89.195.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.00.717.1				500* 50	79.04.723.1			
200* 80	79.00.729.1				500* 80	79.04.735.1			
200*100		30.72.323.1	30.73.323.1	30.89.213.1	500*100	79.04.746.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.05.444.1			
250* 50	79.00.718.1				500*200	79.05.462.1	29.44.904.1	29.59.904.1	31.85.702.1
250* 80	79.00.730.1				500*250	79.05.478.1	29.44.936.1	29.59.934.1	31.85.726.1
250*100	79.00.740.1	29.46.346.1	29.61.346.1	30.89.261.1	500*300	79.05.492.1	31.70.646.1	31.71.646.1	31.85.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.05.504.1	31.70.677.1	31.71.677.1	31.85.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.05.514.1	31.70.707.1	31.71.707.1	31.85.798.1
300* 50	79.00.719.1				500*450	79.05.522.1	31.70.737.1	31.71.737.1	31.85.822.1
300* 80	79.00.731.1				600* 50	79.04.725.1			
300*100	79.00.742.1				600* 80	79.04.737.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.04.748.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.05.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.05.466.1			
350* 50	79.00.720.1				600*250	79.05.482.1	31.70.805.1	31.71.805.1	31.85.846.1
350* 80	79.00.732.1				600*300	79.05.496.1	31.70.825.1	31.71.825.1	31.85.870.1
350*100	79.00.743.1				600*350	79.05.508.1	31.70.845.1	31.71.845.1	31.85.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.05.518.1	31.70.887.1	31.71.887.1	31.85.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.05.526.1	31.70.917.1	31.71.917.1	31.85.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.05.532.1	31.70.947.1	31.71.947.1	31.85.966.1
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	76.83.37.121.1
813	76.80.60.084.1	255	76.83.37.122.1
1219	76.80.60.086.1	305	76.83.37.123.1
1524	76.80.60.088.1	355	76.83.37.125.1
1829	76.80.60.090.1	405	76.83.37.126.1
2134	76.80.60.092.1	455	76.83.37.127.1
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
20	4	5/8	*	90	61.271.1	20	4	5/8	*	90
25	4	5/8	*	90	61.271.1	25	4	5/8	*	90
40	4	3/4	*	110	61.330.1	40	4	3/4	*	110
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	3/8	*	260	61.649.1		350	20	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

BOLTSET WAFER CHECK VALVE

81.38						
DN	NR	INCH	*	MM		
50	8	5/8	*	170	61.284.1	
80	8	3/4	*	210	61.346.1	
100	8	7/8	*	230	61.418.1	
150	12	1	*	330	61.500.1	
200	12	1	1/8	*	370	61.563.1
250	16	1	1/4	*	440	61.630.1
300	20	1	1/4	*	460	61.628.1
350	20	1	3/8	*	520	83.213.1
400	20	1	1/2	*	570	83.288.1
450	20	1	5/8	*	650	83.366.1
500	24	1	5/8	*	670	83.368.1
600	24	1	7/8	*	780	83.519.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMB.)
BLIND FLANGE           1  76.62.10.208.1
GASKET, SPIRAL WOUND   2  85.41.46.104.1
MONOFL SINGLE BLOCK BALL 1  77.00.95.443.1
WELDING NECK FLANGE    1  76.62.79.752.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.444.1
WELDING NECK FLANGE   1  76.62.79.754.1
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* DRAIN POINT                DN 20 FIG.DE    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    85.41.16.106.1
MONOFL SINGLE BLOCK BALL      1    77.00.95.444.1

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* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.043.1
WELDING NECK FLANGE       2  76.62.79.752.1

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```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.043.1
WELDING NECK FLANGE       1    76.62.79.752.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.043.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
WELDING NECK FLANGE       1    76.62.79.752.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1

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* 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  76.83.37.121.1

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* 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                  1   76.83.37.122.1
                                L=255 MM

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.033.1
WELDING NECK FLANGE        1  76.62.79.752.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.034.1
WELDING NECK FLANGE         1  76.62.79.754.1

```

* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.034.1	

CLASS 61420

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA

DN15 -600 99.1 97.7 95.0 92.7 91.9

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
- 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
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	40
300	C	C	C	C	E	E	E	E	B	B	B	A					80	40
250	C	C	C	C	E	E	E	E	B	B	A						100	40
200	C	C	C	C	E	E	E	B	B	A							150	80
150	C	C	C	C	E	B	B	A									200	80
100	C	C	C	C	B	B	B	A									250	80
80	C	C	C	B	B	B	A										300	80
50	C	B	B	B	B	A											350	80
40	B	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. : 61420	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 61420, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-450	ASTM A106-B
		DN500-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* 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 80-450	ASTM A105
		DN500-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	219.1	255.1	295.1	341.1	391.1	445.1	497.1			
	74.30.16																214.1	244.1
* 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	710.1	712.1	714.1	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	605.1	625.1	645.1	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	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1			
	76.31.34																398.1	408.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1			
	76.31.43																398.1	408.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1			
	76.31.80																398.1	408.1
* VALVES																		
BALL VALVE FULL BORE TRUN FLGD	77.00.72					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.72					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 FLANGED	77.10.05	103.1	104.1	105.1	107.1													
	77.10.23					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					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													
GLOBE VALVE FLANGED	77.30.05	103.1	104.1	105.1	107.1													
	77.30.23					108.1	110.1	112.1	114.1									
MONOFL SINGLE BLOCK BALL	77.00.95	443.1	444.1	445.1	447.1	448.1												
* 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	76.64.96	072.1	074.1	076.1	078.1													
ORIFICE FLANGE SET	76.62.95					710.1	712.1	714.1	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		30.66.137.1	30.67.137.1	30.88.035.1	400* 50	79.00.721.1			
25* 15		30.66.147.1	30.67.147.1	30.88.045.1	400* 80	79.00.733.1			
25* 20		30.66.157.1	30.67.157.1	30.88.055.1	400*100	79.00.744.1			
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
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
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* 20		30.66.192.1	30.67.192.1	30.88.100.1	400*300	79.01.488.1	30.66.475.1	30.67.475.1	30.88.533.1
50* 25		30.66.196.1	30.67.196.1	30.88.109.1	400*350	79.01.500.1	30.66.489.1	30.67.489.1	30.88.558.1
50* 40		30.66.206.1	30.67.206.1	30.88.118.1	450* 50	79.00.722.1			
80* 40		30.66.226.1	30.67.226.1	30.88.127.1	450* 80	79.00.734.1			
80* 50	79.00.810.1	30.66.235.1	30.67.235.1	30.88.132.1	450*100	79.00.745.1			
100* 40		30.66.250.1	30.67.250.1	30.88.145.1	450*150	79.01.442.1			
100* 50	79.00.812.1	30.66.265.1	30.67.265.1	30.88.153.1	450*200	79.01.460.1	30.66.505.1	30.67.505.1	30.88.582.1
100* 80	79.00.836.1	30.66.275.1	30.67.275.1	30.88.165.1	450*250	79.01.476.1	30.66.526.1	30.67.526.1	30.88.606.1
150* 50	79.00.716.1				450*300	79.01.490.1	30.66.556.1	30.67.556.1	30.88.630.1
150* 80		30.66.298.1	30.67.298.1	30.88.182.1	450*350	79.01.502.1	30.66.587.1	30.67.587.1	30.88.654.1
150*100		30.66.308.1	30.67.308.1	30.88.195.1	450*400	79.01.512.1	30.66.617.1	30.67.617.1	30.88.678.1
200* 50	79.00.717.1				500* 50	79.04.723.1			
200* 80	79.00.729.1				500* 80	79.04.735.1			
200*100		30.66.323.1	30.67.323.1	30.88.213.1	500*100	79.04.746.1			
200*150	79.01.432.1	30.66.337.1	30.67.337.1	30.88.226.1	500*150	79.05.444.1			
250* 50	79.00.718.1				500*200	79.05.462.1	29.45.904.1	29.60.904.1	31.88.702.1
250* 80	79.00.730.1				500*250	79.05.478.1	29.45.937.1	29.60.938.1	31.88.726.1
250*100	79.00.740.1	29.47.346.1	29.62.346.1	30.88.261.1	500*300	79.05.492.1	31.66.646.1	31.75.646.1	31.88.750.1
250*150	79.01.434.1	30.66.358.1	30.67.358.1	30.88.272.1	500*350	79.05.504.1	31.66.677.1	31.75.677.1	31.88.774.1
250*200	79.01.452.1	30.66.368.1	30.67.368.1	30.88.293.1	500*400	79.05.514.1	31.66.707.1	31.75.707.1	31.88.798.1
300* 50	79.00.719.1				500*450	79.05.522.1	31.66.737.1	31.75.737.1	31.88.822.1
300* 80	79.00.731.1				600* 50	79.04.725.1			
300*100	79.00.742.1				600* 80	79.04.737.1			
300*150	79.01.436.1	30.66.385.1	30.67.385.1	30.88.311.1	600*100	79.04.748.1			
300*200	79.01.454.1	30.66.398.1	30.67.398.1	30.88.330.1	600*150	79.05.448.1			
300*250	79.01.470.1	30.66.408.1	30.67.408.1	30.88.352.1	600*200	79.05.466.1			
350* 50	79.00.720.1				600*250	79.05.482.1	31.66.805.1	31.75.805.1	31.88.846.1
350* 80	79.00.732.1				600*300	79.05.496.1	31.66.825.1	31.75.825.1	31.88.870.1
350*100	79.00.743.1				600*350	79.05.508.1	31.66.845.1	31.75.845.1	31.88.894.1
350*150	79.01.438.1	30.66.415.1	30.67.415.1	30.88.374.1	600*400	79.05.518.1	31.66.887.1	31.75.887.1	31.88.918.1
350*200	79.01.456.1	30.66.424.1	30.67.424.1	30.88.392.1	600*450	79.05.526.1	31.66.917.1	31.75.917.1	31.88.942.1
350*250	79.01.472.1	30.66.439.1	30.67.439.1	30.88.417.1	600*500	79.05.532.1	31.66.947.1	31.75.947.1	31.88.966.1
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	40-150	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	76.81.66.072.1	450	76.81.66.572.1
840	76.81.66.074.1	840	76.81.66.574.1
1230	76.81.66.076.1	1230	76.81.66.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.442.1	230	76.83.37.121.1
813	76.80.60.444.1	255	76.83.37.122.1
1219	76.80.60.446.1	305	76.83.37.123.1
1524	76.80.60.448.1	355	76.83.37.125.1
1829	76.80.60.450.1	405	76.83.37.126.1
2134	76.80.60.452.1	455	76.83.37.127.1
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

BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

					81.38						81.38
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
15	4	1/2	*	80	66.157.1	15	4	1/2	*	80	66.157.1
20	4	5/8	*	90	66.271.1	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	*	110	66.330.1	40	4	3/4	*	110	66.330.1
50	8	5/8	*	110	66.274.1						
80	8	3/4	*	130	66.334.1						
100	8	7/8	*	150	66.406.1						
150	12	1	*	170	66.474.1						
200	12	1	1/8	*	190	66.535.1					
250	16	1	1/4	*	220	66.597.1					
300	20	1	1/4	*	220	66.597.1					
350	20	1	3/8	*	240	66.646.1					
400	20	1	1/2	*	250	66.688.1					
450	20	1	5/8	*	280	66.722.1					
500	24	1	5/8	*	290	66.724.1					
600	24	1	7/8	*	330	66.786.1					

BOLTSET SPECTACLE/SPACER

81.38						81.38						
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		
							15	4	1/2	*	90	66.159.1
							20	4	5/8	*	100	66.273.1
							25	4	5/8	*	100	66.273.1
							40	4	3/4	*	120	66.332.1
50	8	5/8	*	150	66.281.1		50	8	5/8	*	120	66.276.1
80	8	3/4	*	150	66.337.1		80	8	3/4	*	150	66.337.1
100	8	7/8	*	160	66.407.1		100	8	7/8	*	170	66.409.1
150	12	1	*	180	66.475.1		150	12	1	*	210	66.480.1
200	12	1 1/8	*	210	66.538.1		200	12	1 1/8	*	230	66.541.1
250	16	1 1/4	*	230	66.598.1		250	16	1 1/4	*	260	66.603.1
300	20	1 1/4	*	240	66.600.1		300	20	1 1/4	*	270	66.605.1
350	20	3/8	*	260	66.649.1		350	20	3/8	*	290	66.654.1
400	20	1 1/2	*	280	66.693.1		400	20	1 1/2	*	310	66.698.1
450	20	1 5/8	*	300	66.725.1		450	20	1 5/8	*	340	66.732.1
500	24	1 5/8	*	320	66.728.1		500	24	1 5/8	*	360	66.736.1
600	24	1 7/8	*	360	66.791.1		600	24	1 7/8	*	420	66.802.1

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	
50	8	5/8	*	170	66.284.1
80	8	3/4	*	210	66.346.1
100	8	7/8	*	230	66.418.1
150	12	1	*	330	66.500.1
200	12	1 1/8	*	370	66.563.1
250	16	1 1/4	*	440	66.630.1
300	20	1 1/4	*	460	66.637.1
350	20	3/8	*	520	86.213.1
400	20	1/2	*	570	86.288.1
450	20	5/8	*	650	86.366.1
500	24	5/8	*	670	86.368.1
600	24	7/8	*	780	86.519.1

ASSEMBLIES

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* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMB.)
BLIND FLANGE           1  76.62.10.208.1
GASKET, SPIRAL WOUND   2  85.41.46.104.1
MONOFL SINGLE BLOCK BALL 1  77.00.95.443.1
WELDING NECK FLANGE    1  76.62.79.752.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.444.1
WELDING NECK FLANGE    1  76.62.79.754.1
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* DRAIN POINT	DN 20	FIG.DE	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	85.41.146.106.1		
MONOFL SINGLE BLOCK BALL	1	77.00.95.444.1		

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* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.043.1
WELDING NECK FLANGE       2  76.62.79.752.1

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```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.043.1
WELDING NECK FLANGE               1  76.62.79.752.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
```

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.043.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
WELDING NECK FLANGE       1    76.62.79.752.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1

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* 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  76.83.37.121.1

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* 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   76.83.37.122.1

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.033.1
WELDING NECK FLANGE         1  76.62.79.752.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.034.1
WELDING NECK FLANGE         1  76.62.79.754.1

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* VENT POINT                DN 20  FIG.DE  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.034.1

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CLASS 61430

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 102.0 100.0 96.0 92.7 91.9

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.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	B	A	20 160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25 160
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40 160
350	C	C	C	C	E	E	E	B	B	B	B	A					50 160
300	C	C	C	C	E	E	E	B	B	B	A						80 80
250	C	C	C	C	E	E	E	B	B	A							100 80
200	C	C	C	C	E	E	B	B	A								150 80
150	C	C	C	C	E	B	B	A									200 80
100	C	C	C	B	B	B	A										250 80
80	C	C	C	B	B	A											300 80
50	C	B	B	B	A												350 80
40	B	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. : 61430	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 61430, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

API5 PIPE (API 5L-B)	DN 15-350	API 5L-B (SML)
	DN400-450	API 5L-B (WLD)
PIPE PIPE	DN 15-450	ASTM A106-B
	DN500-600	ASTM A333-6

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A105
COFL COVER FLANGE THERMOWELL NOZZLE	---	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 15-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6

* 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 80-450	ASTM A105
	DN500-600	ASTM A350-LF2
RECB REDUCER CONC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
REEB REDUCER ECC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6
TERB TEE REDUCING BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
	DN500-600	ASTM A420-WPL6

* VALVES

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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: AISI 316,STELLITE 6
GAVF GATE VALVE FLANGED	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
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	020.1	030.1	040.1	060.1		109.1	157.1	219.1	255.1	295.1	341.1	391.1				
	74.13.17													445.1	492.1		
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		
	74.30.17															214.1	246.1
* 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		
	76.31.18															399.1	410.1
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		
	76.31.38															399.1	410.1
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		
	76.31.39															399.1	410.1
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		
	76.31.84															400.1	410.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.73					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1
BALL VALVE RED. BORE TRUN FLGD	77.00.73					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 FLANGED	77.10.05	103.1	104.1	105.1	107.1												
	77.10.23					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					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												
GLOBE VALVE FLANGED	77.30.05	103.1	104.1	105.1	107.1												
	77.30.23					108.1	110.1	112.1	114.1								
MONOFL SINGLE BLOCK BALL	77.00.95	443.1	444.1	445.1	447.1	448.1											
* 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	76.64.96	072.1	074.1	076.1	078.1												
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	30.89.098.1	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	30.89.107.1	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	79.06.198.1			
200* 80	79.01.390.1				500* 80	79.05.402.1			
200*100	79.01.412.1	30.72.327.1	30.73.327.1	30.89.206.1	500*100	79.05.424.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.05.444.1			
250* 50	79.02.188.1				500*200	79.05.462.1	29.44.904.1	29.59.904.1	31.85.702.1
250* 80	79.01.392.1				500*250	79.05.478.1	29.44.936.1	29.59.934.1	31.85.726.1
250*100	79.01.414.1	30.72.345.1	30.73.345.1	30.89.254.1	500*300	79.05.492.1	31.70.646.1	31.71.646.1	31.85.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.05.504.1	31.70.677.1	31.71.677.1	31.85.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.05.514.1	31.70.707.1	31.71.707.1	31.85.798.1
300* 50	79.02.190.1				500*450	79.05.522.1	31.70.737.1	31.71.737.1	31.85.822.1
300* 80	79.01.394.1				600* 50	79.06.200.1			
300*100	79.01.416.1				600* 80	79.05.406.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.05.428.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.05.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.05.466.1			
350* 50	79.02.192.1				600*250	79.05.482.1	31.70.805.1	31.71.805.1	31.85.846.1
350* 80	79.01.396.1				600*300	79.05.496.1	31.70.825.1	31.71.825.1	31.85.870.1
350*100	79.01.418.1				600*350	79.05.508.1	31.70.845.1	31.71.845.1	31.85.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.05.518.1	31.70.887.1	31.71.887.1	31.85.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.05.526.1	31.70.917.1	31.71.917.1	31.85.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.05.532.1	31.70.947.1	31.71.947.1	31.85.966.1
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	76.83.37.121.1
813	76.80.60.084.1	255	76.83.37.122.1
1219	76.80.60.086.1	305	76.83.37.123.1
1524	76.80.60.088.1	355	76.83.37.125.1
1829	76.80.60.090.1	405	76.83.37.126.1
2134	76.80.60.092.1	455	76.83.37.127.1
2438	76.80.60.094.1		
2743	76.80.60.096.1		
3048	76.80.60.098.1		

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

BOLTSET WAFER CHECK VALVE

81.38				
DN	NR	INCH	*	MM
50	8	5/8	*	170
80	8	3/4	*	210
100	8	7/8	*	230
150	12	1	*	330
200	12	1 1/8	*	370
250	16	1 1/4	*	440
300	20	1 1/4	*	460
350	20	1 3/8	*	520
400	20	1 1/2	*	570
450	20	1 5/8	*	650
500	24	1 5/8	*	670
600	24	1 7/8	*	780

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.443.1	
WELDING NECK FLANGE	1	76.62.79.802.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.444.1	
WELDING NECK FLANGE	1	76.62.79.804.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.444.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.043.1	
WELDING NECK FLANGE	2	76.62.79.802.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.043.1	
WELDING NECK FLANGE	1	76.62.79.802.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.043.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.043.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.043.1	
WELDING NECK FLANGE	1	76.62.79.802.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.043.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.033.1	
WELDING NECK FLANGE	1	76.62.79.802.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.034.1	
WELDING NECK FLANGE	1	76.62.79.804.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.034.1	

CLASS 61440

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA

DN15 -600 99.1 97.7 95.0 92.7 91.9

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
- 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
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	E	B	B	B	A					50	160
300	C	C	C	C	E	E	E	B	B	B	A						80	80
250	C	C	C	C	E	E	E	B	B	A							100	80
200	C	C	C	C	E	E	B	B	A								150	80
150	C	C	C	C	E	B	B	A									200	80
100	C	C	C	B	B	B	A										250	80
80	C	C	C	B	B	A											300	80
50	C	B	B	B	A												350	80
40	B	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. : 61440	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-450	ASTM A106-B
		DN500-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* 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 80-450	ASTM A105
		DN500-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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			
	74.30.16																214.1	244.1
* 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			
	76.31.34																398.1	408.1
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			
	76.31.43																398.1	408.1
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			
	76.31.80																398.1	408.1
* VALVES																		
BALL VALVE FULL BORE TRUN FLGD	77.00.73					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.73					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 FLANGED	77.10.05	103.1	104.1	105.1	107.1													
	77.10.23					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					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													
GLOBE VALVE FLANGED	77.30.05	103.1	104.1	105.1	107.1													
	77.30.23					108.1	110.1	112.1	114.1									
MONOFL SINGLE BLOCK BALL	77.00.95	443.1	444.1	445.1	447.1	448.1												
* 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	76.64.96	072.1	074.1	076.1	078.1													
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	30.88.079.1	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	30.88.098.1	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	30.88.107.1	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	79.06.198.1			
200* 80	79.01.390.1				500* 80	79.05.402.1			
200*100	79.01.412.1	30.66.327.1	30.67.327.1	30.88.206.1	500*100	79.05.424.1			
200*150	79.01.432.1	30.66.337.1	30.67.337.1	30.88.226.1	500*150	79.05.444.1			
250* 50	79.02.188.1				500*200	79.05.462.1	29.45.904.1	29.60.904.1	31.88.702.1
250* 80	79.01.392.1				500*250	79.05.478.1	29.45.937.1	29.60.938.1	31.88.726.1
250*100	79.01.414.1	30.66.345.1	30.67.345.1	30.88.254.1	500*300	79.05.492.1	31.66.646.1	31.75.646.1	31.88.750.1
250*150	79.01.434.1	30.66.358.1	30.67.358.1	30.88.272.1	500*350	79.05.504.1	31.66.677.1	31.75.677.1	31.88.774.1
250*200	79.01.452.1	30.66.368.1	30.67.368.1	30.88.293.1	500*400	79.05.514.1	31.66.707.1	31.75.707.1	31.88.798.1
300* 50	79.02.190.1				500*450	79.05.522.1	31.66.737.1	31.75.737.1	31.88.822.1
300* 80	79.01.394.1				600* 50	79.06.200.1			
300*100	79.01.416.1				600* 80	79.05.406.1			
300*150	79.01.436.1	30.66.385.1	30.67.385.1	30.88.311.1	600*100	79.05.428.1			
300*200	79.01.454.1	30.66.398.1	30.67.398.1	30.88.330.1	600*150	79.05.448.1			
300*250	79.01.470.1	30.66.408.1	30.67.408.1	30.88.352.1	600*200	79.05.466.1			
350* 50	79.02.192.1				600*250	79.05.482.1	31.66.805.1	31.75.805.1	31.88.846.1
350* 80	79.01.396.1				600*300	79.05.496.1	31.66.825.1	31.75.825.1	31.88.870.1
350*100	79.01.418.1				600*350	79.05.508.1	31.66.845.1	31.75.845.1	31.88.894.1
350*150	79.01.438.1	30.66.415.1	30.67.415.1	30.88.374.1	600*400	79.05.518.1	31.66.887.1	31.75.887.1	31.88.918.1
350*200	79.01.456.1	30.66.424.1	30.67.424.1	30.88.392.1	600*450	79.05.526.1	31.66.917.1	31.75.917.1	31.88.942.1
350*250	79.01.472.1	30.66.439.1	30.67.439.1	30.88.417.1	600*500	79.05.532.1	31.66.947.1	31.75.947.1	31.88.966.1
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.66.072.1	450	76.81.66.572.1
840	76.81.66.074.1	840	76.81.66.574.1
1230	76.81.66.076.1	1230	76.81.66.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.442.1	230	76.83.37.121.1
813	76.80.60.444.1	255	76.83.37.122.1
1219	76.80.60.446.1	305	76.83.37.123.1
1524	76.80.60.448.1	355	76.83.37.125.1
1829	76.80.60.450.1	405	76.83.37.126.1
2134	76.80.60.452.1	455	76.83.37.127.1
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

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.043.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
WELDING NECK FLANGE       1  76.62.79.802.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1

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* 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  76.83.37.121.1

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* 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   76.83.37.122.1

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.033.1
WELDING NECK FLANGE         1  76.62.79.802.1

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* VENT POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.034.1
WELDING NECK FLANGE  1  76.62.79.804.1

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* VENT POINT                DN 20  FIG.DE   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
MONOFL SINGLE BLOCK NEEDLE 1    77.30.91.034.1

```

BOLTSET WAFER CHECK VALVE

					81.38	
DN	NR	INCH	*	MM		

50	8	5/8	*	170	66.284.1	
80	8	3/4	*	210	66.346.1	
100	8	7/8	*	230	66.418.1	
150	12	1	*	330	66.500.1	
200	12	1	1/8	*	370	66.563.1
250	16	1	1/4	*	440	66.630.1
300	20	1	1/4	*	460	66.637.1
350	20	1	3/8	*	520	86.213.1
400	20	1	1/2	*	570	86.288.1
450	20	1	5/8	*	650	86.366.1
500	24	1	5/8	*	670	86.368.1
600	24	1	7/8	*	780	86.519.1

CLASS 61441

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 99.1 97.7 95.0 92.7 91.9

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - 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
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	B	A	20 160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25 160
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40 160
350	C	C	C	C	E	E	E	B	B	B	B	A					50 160
300	C	C	C	C	E	E	E	B	B	B	A						80 80
250	C	C	C	C	E	E	E	B	B	A							100 80
200	C	C	C	C	E	E	B	B	A								150 80
150	C	C	C	C	E	B	B	A									200 80
100	C	C	C	B	B	B	A										250 80
80	C	C	C	B	B	A											300 80
50	C	B	B	B	A												350 80
40	B	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. : 61441	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-450	ASTM A106-B
		DN500-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* 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 80-450	ASTM A105
		DN500-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: ASTM A105 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

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	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			
	74.30.16																214.1	244.1
* 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			
	76.31.34																398.1	408.1
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			
	76.31.43																398.1	408.1
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			
	76.31.80																398.1	408.1
* VALVES																		
BALL VALVE FULL BORE TRUN FLGD	77.00.91					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.91					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 FLANGED	77.10.43	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.57					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	77.20.53	103.1	104.1	105.1	107.1													
GLOBE VALVE FLANGED	77.30.53	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1									
MONOFL SINGLE BLOCK BALL	77.00.97	443.1	444.1	445.1	447.1	448.1												
* 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	76.64.96	072.1	074.1	076.1	078.1													
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	30.88.079.1	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	30.88.098.1	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	30.88.107.1	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	79.06.198.1			
200* 80	79.01.390.1				500* 80	79.05.402.1			
200*100	79.01.412.1	30.66.327.1	30.67.327.1	30.88.206.1	500*100	79.05.424.1			
200*150	79.01.432.1	30.66.337.1	30.67.337.1	30.88.226.1	500*150	79.05.444.1			
250* 50	79.02.188.1				500*200	79.05.462.1	29.45.904.1	29.60.904.1	31.88.702.1
250* 80	79.01.392.1				500*250	79.05.478.1	29.45.937.1	29.60.938.1	31.88.726.1
250*100	79.01.414.1	30.66.345.1	30.67.345.1	30.88.254.1	500*300	79.05.492.1	31.66.646.1	31.75.646.1	31.88.750.1
250*150	79.01.434.1	30.66.358.1	30.67.358.1	30.88.272.1	500*350	79.05.504.1	31.66.677.1	31.75.677.1	31.88.774.1
250*200	79.01.452.1	30.66.368.1	30.67.368.1	30.88.293.1	500*400	79.05.514.1	31.66.707.1	31.75.707.1	31.88.798.1
300* 50	79.02.190.1				500*450	79.05.522.1	31.66.737.1	31.75.737.1	31.88.822.1
300* 80	79.01.394.1				600* 50	79.06.200.1			
300*100	79.01.416.1				600* 80	79.05.406.1			
300*150	79.01.436.1	30.66.385.1	30.67.385.1	30.88.311.1	600*100	79.05.428.1			
300*200	79.01.454.1	30.66.398.1	30.67.398.1	30.88.330.1	600*150	79.05.448.1			
300*250	79.01.470.1	30.66.408.1	30.67.408.1	30.88.352.1	600*200	79.05.466.1			
350* 50	79.02.192.1				600*250	79.05.482.1	31.66.805.1	31.75.805.1	31.88.846.1
350* 80	79.01.396.1				600*300	79.05.496.1	31.66.825.1	31.75.825.1	31.88.870.1
350*100	79.01.418.1				600*350	79.05.508.1	31.66.845.1	31.75.845.1	31.88.894.1
350*150	79.01.438.1	30.66.415.1	30.67.415.1	30.88.374.1	600*400	79.05.518.1	31.66.887.1	31.75.887.1	31.88.918.1
350*200	79.01.456.1	30.66.424.1	30.67.424.1	30.88.392.1	600*450	79.05.526.1	31.66.917.1	31.75.917.1	31.88.942.1
350*250	79.01.472.1	30.66.439.1	30.67.439.1	30.88.417.1	600*500	79.05.532.1	31.66.947.1	31.75.947.1	31.88.966.1
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.66.072.1	450	76.81.66.572.1
840	76.81.66.074.1	840	76.81.66.574.1
1230	76.81.66.076.1	1230	76.81.66.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.442.1	230	76.83.37.121.1
813	76.80.60.444.1	255	76.83.37.122.1
1219	76.80.60.446.1	305	76.83.37.123.1
1524	76.80.60.448.1	355	76.83.37.125.1
1829	76.80.60.450.1	405	76.83.37.126.1
2134	76.80.60.452.1	455	76.83.37.127.1
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

BOLTSET WAFER CHECK VALVE

81.38				
DN	NR	INCH	*	MM
50	8	5/8	*	170
80	8	3/4	*	210
100	8	7/8	*	230
150	12	1	*	330
200	12	1 1/8	*	370
250	16	1 1/4	*	440
300	20	1 1/4	*	460
350	20	1 3/8	*	520
400	20	1 1/2	*	570
450	20	1 5/8	*	650
500	24	1 5/8	*	670
600	24	1 7/8	*	780

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.443.1	
WELDING NECK FLANGE	1	76.62.79.802.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.444.1	
WELDING NECK FLANGE	1	76.62.79.804.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.444.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.343.1	
WELDING NECK FLANGE	2	76.62.79.802.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.343.1	
WELDING NECK FLANGE	1	76.62.79.802.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.343.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.343.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.343.1	
WELDING NECK FLANGE	1	76.62.79.802.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.343.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.033.1	
WELDING NECK FLANGE	1	76.62.79.802.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.034.1	
WELDING NECK FLANGE	1	76.62.79.804.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.034.1	

CLASS 61450

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	120	150	200

	PRESSURE BAR GA						
DN15 -600	102.0	100.0	96.0	92.7	91.9	90.6	87.8

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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40
300	C	C	C	C	E	E	E	B	B	B	A						80	40
250	C	C	C	C	E	E	E	B	B	A							100	40
200	C	C	C	C	E	E	B	B	A								150	80
150	C	C	C	C	E	B	B	A									200	80
100	C	C	C	B	B	B	A										250	80
80	C	C	C	B	B	A											300	80
50	C	B	B	B	A												350	80
40	B	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	PLANT	:	
CLASS NO. : 61450	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

API5	PIPE (API 5L-B)	DN 15-350	API 5L-B (SML)
		DN400-450	API 5L-B (WLD)
PIPE	PIPE	DN 15-450	ASTM A106-B
		DN500-600	ASTM A333-6

* 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 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* 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 80-450	ASTM A105
		DN500-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			BODY: ASTM A216-WCB/WCC,A105
			TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-150	TRIM: AISI 316(L),STELLITE 6
			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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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)	74.13.12	018.1	028.1	038.1	058.1	069.1	103.1	149.1	219.1	255.1	295.1	341.1	391.1				
	74.13.17													445.1	492.1		
PIPE	74.30.05	018.1	028.1	038.1	058.1	069.1	103.1	149.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1		
	74.30.17															214.1	246.1
* 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	710.1	712.1	714.1	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	055.1	075.1	095.1	118.1	139.1	160.1	183.1	202.1	222.1	244.1		
	76.31.18															399.1	410.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1		
	76.31.38															399.1	410.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1		
	76.31.39															399.1	410.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1		
	76.31.84															400.1	410.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	103.1	104.1	105.1	107.1												
	77.10.23					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					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												
	77.20.23					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												
	77.30.23					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	76.64.96	072.1	074.1	076.1	078.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	714.1	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	79.00.721.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.00.733.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.00.744.1			
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		29.46.192.1	29.61.192.1	30.89.100.1	400*300	79.01.488.1	30.72.475.1	30.73.475.1	30.89.533.1
50* 25		30.72.196.1	30.73.196.1	30.89.109.1	400*350	79.01.500.1	30.72.489.1	30.73.489.1	30.89.558.1
50* 40		30.72.206.1	30.73.206.1	30.89.118.1	450* 50	79.00.722.1			
80* 40		30.72.226.1	30.73.226.1	30.89.127.1	450* 80	79.00.734.1			
80* 50	79.00.810.1	30.72.235.1	30.73.235.1	30.89.132.1	450*100	79.00.745.1			
100* 40		30.72.250.1	30.73.250.1	30.89.145.1	450*150	79.01.442.1			
100* 50	79.00.812.1	30.72.265.1	30.73.265.1	30.89.153.1	450*200	79.01.460.1	30.72.505.1	30.73.505.1	30.89.582.1
100* 80	79.00.836.1	30.72.275.1	30.73.275.1	30.89.165.1	450*250	79.01.476.1	30.72.526.1	30.73.526.1	30.89.606.1
150* 50	79.00.716.1				450*300	79.01.490.1	30.72.556.1	30.73.556.1	30.89.630.1
150* 80		30.72.298.1	30.73.298.1	30.89.182.1	450*350	79.01.502.1	30.72.587.1	30.73.587.1	30.89.654.1
150*100		30.72.308.1	30.73.308.1	30.89.195.1	450*400	79.01.512.1	30.72.617.1	30.73.617.1	30.89.678.1
200* 50	79.00.717.1				500* 50	79.04.723.1			
200* 80	79.00.729.1				500* 80	79.04.735.1			
200*100		30.72.323.1	30.73.323.1	30.89.213.1	500*100	79.04.746.1			
200*150	79.01.432.1	30.72.337.1	30.73.337.1	30.89.226.1	500*150	79.05.444.1			
250* 50	79.00.718.1				500*200	79.05.462.1	29.44.904.1	29.59.904.1	31.85.702.1
250* 80	79.00.730.1				500*250	79.05.478.1	29.44.936.1	29.59.934.1	31.85.726.1
250*100	79.00.740.1	29.46.346.1	29.61.346.1	30.89.261.1	500*300	79.05.492.1	31.70.646.1	31.71.646.1	31.85.750.1
250*150	79.01.434.1	30.72.358.1	30.73.358.1	30.89.272.1	500*350	79.05.504.1	31.70.677.1	31.71.677.1	31.85.774.1
250*200	79.01.452.1	30.72.368.1	30.73.368.1	30.89.293.1	500*400	79.05.514.1	31.70.707.1	31.71.707.1	31.85.798.1
300* 50	79.00.719.1				500*450	79.05.522.1	31.70.737.1	31.71.737.1	31.85.822.1
300* 80	79.00.731.1				600* 50	79.04.725.1			
300*100	79.00.742.1				600* 80	79.04.737.1			
300*150	79.01.436.1	30.72.385.1	30.73.385.1	30.89.311.1	600*100	79.04.748.1			
300*200	79.01.454.1	30.72.398.1	30.73.398.1	30.89.330.1	600*150	79.05.448.1			
300*250	79.01.470.1	30.72.408.1	30.73.408.1	30.89.352.1	600*200	79.05.466.1			
350* 50	79.00.720.1				600*250	79.05.482.1	31.70.805.1	31.71.805.1	31.85.846.1
350* 80	79.00.732.1				600*300	79.05.496.1	31.70.825.1	31.71.825.1	31.85.870.1
350*100	79.00.743.1				600*350	79.05.508.1	31.70.845.1	31.71.845.1	31.85.894.1
350*150	79.01.438.1	30.72.415.1	30.73.415.1	30.89.374.1	600*400	79.05.518.1	31.70.887.1	31.71.887.1	31.85.918.1
350*200	79.01.456.1	30.72.424.1	30.73.424.1	30.89.392.1	600*450	79.05.526.1	31.70.917.1	31.71.917.1	31.85.942.1
350*250	79.01.472.1	30.72.439.1	30.73.439.1	30.89.417.1	600*500	79.05.532.1	31.70.947.1	31.71.947.1	31.85.966.1
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	76.83.37.121.1
813	76.80.60.084.1	255	76.83.37.122.1
1219	76.80.60.086.1	305	76.83.37.123.1
1524	76.80.60.088.1	355	76.83.37.125.1
1829	76.80.60.090.1	405	76.83.37.126.1
2134	76.80.60.092.1	455	76.83.37.127.1
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	

BOLTSET WAFER CHECK VALVE

81.38				
DN	NR	INCH	* MM	
50	8	5/8	* 170	61.284.1
80	8	3/4	* 210	61.346.1
100	8	7/8	* 230	61.418.1
150	12	1	* 330	61.500.1
200	12	1 1/8	* 370	61.563.1
250	16	1 1/4	* 440	61.630.1
300	20	1 1/4	* 460	61.628.1
350	20	3/8	* 520	83.213.1
400	20	1 1/2	* 570	83.288.1
450	20	5/8	* 650	83.366.1
500	24	5/8	* 670	83.368.1
600	24	7/8	* 780	83.519.1

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

```

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* DRAIN POINT                DN 20  FIG.OI  DN 40 - 40
Branch: (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.0H	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 INTR.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   77.20.04.103.1
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 - 40
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.01  DN 50 -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
WELDING NECK FLANGE         1  76.62.79.752.1

```

```

* 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.COM.)
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                  1  76.83.37.121.1
                                L=230 MM
```

```

* TEMPERATURE INSTR.C.   DN 40  FIG.BB   DN150 -600
Branch: S (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING.COM.)
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                   1  76.83.37.122.1
L=255 MM

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```

* VENT POINT                      DN 15  FIG.11  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

```

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* VENT POINT                      DN 20  FIG.11  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(P1PING 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=N/A) 1(PIPING.COM.)
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 61460

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	120	150	200

	PRESSURE BAR GA						
DN15 -600	99.1	97.7	95.0	92.7	91.9	90.6	87.8

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40
300	C	C	C	C	E	E	E	B	B	B	A						80	40
250	C	C	C	C	E	E	E	B	B	A							100	40
200	C	C	C	C	E	E	B	B	A								150	80
150	C	C	C	C	E	B	B	A									200	80
100	C	C	C	B	B	B	A										250	80
80	C	C	C	B	B	A											300	80
50	C	B	B	B	A												350	80
40	B	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. : 61460	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 61460, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-450	ASTM A106-B
		DN500-600	ASTM A333-6

* 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 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* 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 80-450	ASTM A105
		DN500-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-450	ASTM A234-WPB
		DN500-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			BODY: ASTM A216-WCB/WCC,A105
			TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-150	TRIM: AISI 316(L),STELLITE 6
			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-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	018.1	028.1	038.1	058.1	069.1	103.1	149.1	219.1	255.1	295.1	341.1	391.1	445.1	497.1		
	74.30.16															214.1	244.1
* 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	710.1	712.1	714.1	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	605.1	625.1	645.1	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	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1		
	76.31.34															398.1	408.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1		
	76.31.43															398.1	408.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	568.1	574.1	580.1	588.1	605.1	625.1	645.1	668.1	689.1	710.1	733.1	752.1	772.1	794.1		
	76.31.80															398.1	408.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	103.1	104.1	105.1	107.1												
	77.10.23					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	120.1	121.1	123.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					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												
	77.20.23					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												
	77.30.23					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	76.64.96	072.1	074.1	076.1	078.1												
ORIFICE FLANGE SET	76.62.95					710.1	712.1	714.1	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		30.66.137.1	30.67.137.1	30.88.035.1	400* 50	79.00.721.1			
25* 15		30.66.147.1	30.67.147.1	30.88.045.1	400* 80	79.00.733.1			
25* 20		30.66.157.1	30.67.157.1	30.88.055.1	400*100	79.00.744.1			
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
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
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* 20		30.66.192.1	30.67.192.1	30.88.100.1	400*300	79.01.488.1	30.66.475.1	30.67.475.1	30.88.533.1
50* 25		30.66.196.1	30.67.196.1	30.88.109.1	400*350	79.01.500.1	30.66.489.1	30.67.489.1	30.88.558.1
50* 40		30.66.206.1	30.67.206.1	30.88.118.1	450* 50	79.00.722.1			
80* 40		30.66.226.1	30.67.226.1	30.88.127.1	450* 80	79.00.734.1			
80* 50	79.00.810.1	30.66.235.1	30.67.235.1	30.88.132.1	450*100	79.00.745.1			
100* 40		30.66.250.1	30.67.250.1	30.88.145.1	450*150	79.01.442.1			
100* 50	79.00.812.1	30.66.265.1	30.67.265.1	30.88.153.1	450*200	79.01.460.1	30.66.505.1	30.67.505.1	30.88.582.1
100* 80	79.00.836.1	30.66.275.1	30.67.275.1	30.88.165.1	450*250	79.01.476.1	30.66.526.1	30.67.526.1	30.88.606.1
150* 50	79.00.716.1				450*300	79.01.490.1	30.66.556.1	30.67.556.1	30.88.630.1
150* 80		30.66.298.1	30.67.298.1	30.88.182.1	450*350	79.01.502.1	30.66.587.1	30.67.587.1	30.88.654.1
150*100		30.66.308.1	30.67.308.1	30.88.195.1	450*400	79.01.512.1	30.66.617.1	30.67.617.1	30.88.678.1
200* 50	79.00.717.1				500* 50	79.04.723.1			
200* 80	79.00.729.1				500* 80	79.04.735.1			
200*100		30.66.323.1	30.67.323.1	30.88.213.1	500*100	79.04.746.1			
200*150	79.01.432.1	30.66.337.1	30.67.337.1	30.88.226.1	500*150	79.05.444.1			
250* 50	79.00.718.1				500*200	79.05.462.1	29.45.904.1	29.60.904.1	31.88.702.1
250* 80	79.00.730.1				500*250	79.05.478.1	29.45.937.1	29.60.938.1	31.88.726.1
250*100	79.00.740.1	29.47.346.1	29.62.346.1	30.88.261.1	500*300	79.05.492.1	31.66.646.1	31.75.646.1	31.88.750.1
250*150	79.01.434.1	30.66.358.1	30.67.358.1	30.88.272.1	500*350	79.05.504.1	31.66.677.1	31.75.677.1	31.88.774.1
250*200	79.01.452.1	30.66.368.1	30.67.368.1	30.88.293.1	500*400	79.05.514.1	31.66.707.1	31.75.707.1	31.88.798.1
300* 50	79.00.719.1				500*450	79.05.522.1	31.66.737.1	31.75.737.1	31.88.822.1
300* 80	79.00.731.1				600* 50	79.04.725.1			
300*100	79.00.742.1				600* 80	79.04.737.1			
300*150	79.01.436.1	30.66.385.1	30.67.385.1	30.88.311.1	600*100	79.04.748.1			
300*200	79.01.454.1	30.66.398.1	30.67.398.1	30.88.330.1	600*150	79.05.448.1			
300*250	79.01.470.1	30.66.408.1	30.67.408.1	30.88.352.1	600*200	79.05.466.1			
350* 50	79.00.720.1				600*250	79.05.482.1	31.66.805.1	31.75.805.1	31.88.846.1
350* 80	79.00.732.1				600*300	79.05.496.1	31.66.825.1	31.75.825.1	31.88.870.1
350*100	79.00.743.1				600*350	79.05.508.1	31.66.845.1	31.75.845.1	31.88.894.1
350*150	79.01.438.1	30.66.415.1	30.67.415.1	30.88.374.1	600*400	79.05.518.1	31.66.887.1	31.75.887.1	31.88.918.1
350*200	79.01.456.1	30.66.424.1	30.67.424.1	30.88.392.1	600*450	79.05.526.1	31.66.917.1	31.75.917.1	31.88.942.1
350*250	79.01.472.1	30.66.439.1	30.67.439.1	30.88.417.1	600*500	79.05.532.1	31.66.947.1	31.75.947.1	31.88.966.1
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	40-150	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	76.81.66.072.1	450	76.81.66.572.1
840	76.81.66.074.1	840	76.81.66.574.1
1230	76.81.66.076.1	1230	76.81.66.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.442.1	230	76.83.37.121.1
813	76.80.60.444.1	255	76.83.37.122.1
1219	76.80.60.446.1	305	76.83.37.123.1
1524	76.80.60.448.1	355	76.83.37.125.1
1829	76.80.60.450.1	405	76.83.37.126.1
2134	76.80.60.452.1	455	76.83.37.127.1
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	66.157.1	15	4	1/2	* 80	66.157.1
20	4	5/8	* 90	66.271.1	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	* 110	66.330.1	40	4	3/4	* 110	66.330.1
50	8	5/8	* 110	66.274.1					
80	8	3/4	* 130	66.334.1					
100	8	7/8	* 150	66.406.1					
150	12	1	* 170	66.474.1					
200	12	1 1/8	* 190	66.535.1					
250	16	1 1/4	* 220	66.597.1					
300	20	1 1/4	* 220	66.597.1					
350	20	1 3/8	* 240	66.646.1					
400	20	1 1/2	* 250	66.688.1					
450	20	1 5/8	* 280	66.722.1					
500	24	1 5/8	* 290	66.724.1					
600	24	1 7/8	* 330	66.786.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38						
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		
							15	4	1/2	*	90	66.159.1
							20	4	5/8	*	100	66.273.1
							25	4	5/8	*	100	66.273.1
							40	4	3/4	*	120	66.332.1
50	8	5/8	*	150	66.281.1		50	8	5/8	*	120	66.276.1
80	8	3/4	*	150	66.337.1		80	8	3/4	*	150	66.337.1
100	8	7/8	*	160	66.407.1		100	8	7/8	*	170	66.409.1
150	12	1	*	180	66.475.1	150	12	1	*	210	66.480.1	
200	12	1 1/8	*	210	66.538.1	200	12	1 1/8	*	230	66.541.1	
250	16	1 1/4	*	230	66.598.1	250	16	1 1/4	*	260	66.603.1	
300	20	1 1/4	*	240	66.600.1	300	20	1 1/4	*	270	66.605.1	
350	20	1 3/8	*	260	66.649.1	350	20	1 3/8	*	290	66.654.1	
400	20	1 1/2	*	280	66.693.1	400	20	1 1/2	*	310	66.698.1	
450	20	1 5/8	*	300	66.725.1	450	20	1 5/8	*	340	66.732.1	
500	24	1 5/8	*	320	66.728.1	500	24	1 5/8	*	360	66.736.1	
600	24	1 7/8	*	360	66.791.1	600	24	1 7/8	*	420	66.802.1	

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	5/8	* 170	66.284.1
80	8	3/4	* 210	66.346.1
100	8	7/8	* 230	66.418.1
150	12	1	* 330	66.500.1
200	12	1 1/8	* 370	66.563.1
250	16	1 1/4	* 440	66.630.1
300	20	1 1/4	* 460	66.637.1
350	20	1 3/8	* 520	86.213.1
400	20	1 1/2	* 570	86.288.1
450	20	1 5/8	* 650	86.366.1
500	24	1 5/8	* 670	86.368.1
600	24	1 7/8	* 780	86.519.1

ASSEMBLIES

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* 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    81.38.66.157.1
WELDING NECK FLANGE          1    76.62.79.752.1

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* DRAIN POINT                DN 20  FIG.OI  DN 40 - 40
Branch: (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  81.38.66.271.1
WELDING NECK FLANGE          1  76.62.79.754.1

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* DRAIN POINT	DN 20	FIG.0H	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,:=N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.212.1	
GASKET, SPIRAL WOUND	2	85.41.46.106.1	
GATE VALVE FLANGED	1	77.20.04.104.1	
STUD BOLT WITH NUTS	8	81.38.66.271.1	

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* ORIFICE INTR.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   77.20.04.103.1
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
WELDING NECK FLANGE       2   76.62.79.752.1

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* PRESSURE INSTR.CONN.      DN 15  FIG.0I  DN 15 - 40
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  81.38.66.157.1
                             4  81.38.66.157.1
WELDING NECK FLANGE         1  76.62.79.752.1

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* PRESSURE INSTR.CONN.      DN 15  FIG.01  DN 50 -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  81.38.66.157.1
                             4  81.38.66.157.1
WELDING NECK FLANGE         1  76.62.79.752.1

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* 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

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* TEMPERATURE INSTR.C.      DN 40  FIG.AA  DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING.COM.)
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                  1  76.83.37.121.1
                                L=230 MM

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* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -600
Branch: (:N=br.tab,:S=BNIF,:N/A) 1(PIPING.COM.)
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                  1   76.83.37.122.1
L=255 MM

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* 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  81.38.66.157.1
WELDING NECK FLANGE              1  76.62.79.752.1

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* VENT POINT                      DN 20  FIG.11  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 81.38.66.271.1
WELDING NECK FLANGE              1 76.62.79.754.1

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* VENT POINT                DN 20  FIG.1H  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,:N=N/A) 1(PIPING.COM.)
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  81.38.66.271.1

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CLASS 61470

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -400	95.8	95.8	94.7	92.3	90.3	89.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	B	B	B	B	A	
250	C	C	C	C	E	E	E	B	B	B	A		
200	C	C	C	C	E	E	E	B	B	B	A		
150	C	C	C	C	E	E	B	B	A				
100	C	C	C	C	B	B	B	A					
80	C	C	C	B	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	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 LOW TEMP.	PLANT :	
CLASS NO. : 61470	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 61470, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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
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	MONEL 400 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	MONEL 400

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

* 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
* 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														
BALL VALVE FULL BORE TRUN FLGD	77.00.82					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1
BALL VALVE RED. BORE TRUN FLGD	77.00.82					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1
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
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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									
GLOBE VALVE FLANGED	77.30.33	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1					
MONOFL SINGLE BLOCK BALL	77.00.95	443.1	444.1	445.1	447.1	448.1								
* 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	76.64.96	072.1	074.1	076.1	078.1									
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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.67.072.1	450	76.81.67.572.1
840	76.81.67.074.1	840	76.81.67.574.1
1230	76.81.67.076.1	1230	76.81.67.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.282.1	230	76.83.37.121.1
813	76.80.60.284.1	255	76.83.37.122.1
1219	76.80.60.286.1	305	76.83.37.123.1
1524	76.80.60.288.1	355	76.83.37.125.1
1829	76.80.60.290.1	405	76.83.37.126.1
2134	76.80.60.292.1	455	76.83.37.127.1
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

BOLTSET FLANGED JOINTS

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

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	5/8	*	170	63.284.1
80	8	3/4	*	210	63.346.1
100	8	7/8	*	230	63.418.1
150	12	1	*	330	63.500.1
200	12	1 1/8	*	370	63.563.1
250	16	1 1/4	*	440	63.628.1
300	20	1 1/4	*	460	63.637.1
350	20	3/8	*	520	63.667.1
400	20	1 1/2	*	570	63.714.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING.COM.)
BLIND FLANGE          1  76.62.12.558.1
GASKET, SPIRAL WOUND  2  85.41.46.104.1
MONOFL SINGLE BLOCK BALL  1  77.00.95.443.1
WELDING NECK FLANGE   1  76.62.86.152.1

```

```
* DRAIN POINT          DN 20  FIG.DF      DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING.COM.)
BLIND FLANGE          1  76.62.12.562.1
GASKET, SPIRAL WOUND  2  85.41.46.106.1
MONOFL SINGLE BLOCK BALL  1  77.00.95.444.1
WELDING NECK FLANGE   1  76.62.86.154.1
```

* DRAIN POINT	DN 20	FIG.DE	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	14.6106	1
MONOFL SINGLE BLOCK BALL	1	77.00	95.444	1

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.043.1
WELDING NECK FLANGE       2  76.62.86.152.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB  DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
WELDING NECK FLANGE      1  76.62.86.152.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
```

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```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.043.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
WELDING NECK FLANGE       1    76.62.86.152.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1

```

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* 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      76.83.37.121.1

```

```

* 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               1   76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30,91.033.1
WELDING NECK FLANGE         1  76.62,86.152.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.034.1
WELDING NECK FLANGE        1  76.62.86.154.1

```

```

* VENT POINT                DN 20  FIG.DE   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
MONOFL SINGLE BLOCK NEEDLE 1    77.30.91.034.1

```

CLASS 61480

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120
-----	-----					
	PRESSURE BAR GA					
DN15 -400	95.8	95.8	94.7	92.3	90.3	89.3

- 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.
COLD BENDING IS NOT ALLOWED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B B B B A
350	C	C	C	C	E	E	E	B	B	B B A
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	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	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 LOW TEMP. SOUR	PLANT :	
CLASS NO. : 61480	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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
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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE															
PIPE	74.30.16	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	
* 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	76.88.35	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)	76.88.47	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	76.31.17	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	76.31.34	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	76.31.43	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	76.31.80	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															
BALL VALVE FULL BORE TRUN FLGD	77.00.82					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.82					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	
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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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										
GLOBE VALVE FLANGED	77.30.33	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1						
MONOFL SINGLE BLOCK BALL	77.00.95	443.1	444.1	445.1	447.1	448.1									
* 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	76.64.96	072.1	074.1	076.1	078.1										
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		31.66.137.1	31.75.137.1	31.88.035.1	400* 50	79.04.721.1			
25* 15		31.66.147.1	31.75.147.1	31.88.045.1	400* 80	79.04.733.1			
25* 20		31.66.157.1	31.75.157.1	31.88.055.1	400*100	79.04.744.1			
40* 15		31.66.167.1	31.75.167.1	31.88.065.1	400*150	79.05.440.1	29.45.740.1	29.60.740.1	31.88.464.1
40* 20		31.66.177.1	31.75.177.1	31.88.075.1	400*200	79.05.458.1	31.66.455.1	31.75.455.1	31.88.481.1
40* 25		31.66.187.1	31.75.187.1	31.88.085.1	400*250	79.05.474.1	31.66.464.1	31.75.464.1	31.88.507.1
50* 20		31.66.192.1	31.75.192.1	31.88.100.1	400*300	79.05.488.1	31.66.475.1	31.75.475.1	31.88.533.1
50* 25		31.66.198.1	31.75.198.1	31.88.109.1	400*350	79.05.500.1	31.66.489.1	31.75.489.1	31.88.558.1
50* 40		31.66.206.1	31.75.206.1	31.88.118.1					
80* 40		31.66.226.1	31.75.226.1	31.88.127.1					
80* 50	79.04.810.1	31.66.235.1	31.75.235.1	31.88.132.1					
100* 40		31.66.250.1	31.75.250.1	31.88.145.1					
100* 50	79.04.812.1	31.66.265.1	31.75.265.1	31.88.153.1					
100* 80	79.04.836.1	31.66.275.1	31.75.275.1	31.88.165.1					
150* 50	79.04.716.1								
150* 80	79.04.728.1	31.66.298.1	31.75.298.1	31.88.182.1					
150*100	79.04.739.1	31.66.308.1	31.75.308.1	31.88.195.1					
200* 50	79.04.717.1								
200* 80	79.04.729.1								
200*100	79.04.740.1	31.66.323.1	31.75.323.1	31.88.213.1					
200*150	79.05.432.1	31.66.337.1	31.75.337.1	31.88.226.1					
250* 50	79.04.718.1								
250* 80	79.04.730.1								
250*100	79.04.741.1	29.45.346.1	29.60.346.1	31.88.260.1					
250*150	79.05.434.1	31.66.358.1	31.75.358.1	31.88.272.1					
250*200	79.05.452.1	31.66.367.1	31.75.367.1	31.88.293.1					
300* 50	79.04.719.1								
300* 80	79.04.731.1								
300*100	79.04.742.1								
300*150	79.05.436.1	31.66.385.1	31.75.385.1	31.88.311.1					
300*200	79.05.454.1	31.66.397.1	31.75.397.1	31.88.330.1					
300*250	79.05.470.1	31.66.408.1	31.75.408.1	31.88.352.1					
350* 50	79.04.720.1								
350* 80	79.04.732.1								
350*100	79.04.743.1								
350*150	79.05.438.1	31.66.415.1	31.75.415.1	31.88.374.1					
350*200	79.05.456.1	31.66.424.1	31.75.424.1	31.88.392.1					
350*250	79.05.472.1	31.66.439.1	31.75.439.1	31.88.417.1					
350*300	79.05.486.1	31.66.449.1	31.75.449.1	31.88.443.1					

		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 GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.68.072.1	450	76.81.68.572.1
840	76.81.68.074.1	840	76.81.68.574.1
1230	76.81.68.076.1	1230	76.81.68.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.622.1	230	76.83.37.121.1
813	76.80.60.624.1	255	76.83.37.122.1
1219	76.80.60.626.1	305	76.83.37.123.1
1524	76.80.60.628.1	355	76.83.37.125.1
1829	76.80.60.630.1	405	76.83.37.126.1
2134	76.80.60.632.1	455	76.83.37.127.1
2438	76.80.60.634.1		
2743	76.80.60.636.1		
3048	76.80.60.638.1		

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

BOLTSET FLANGED JOINTS

					81.38						81.38
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
15	4	1/2	*	80	67.157.1	15	4	1/2	*	80	67.157.1
20	4	5/8	*	90	67.271.1	20	4	5/8	*	90	67.271.1
25	4	5/8	*	90	67.271.1	25	4	5/8	*	90	67.271.1
40	4	3/4	*	110	67.330.1	40	4	3/4	*	110	67.330.1
50	8	5/8	*	110	67.274.1						
80	8	3/4	*	130	67.334.1						
100	8	7/8	*	150	67.406.1						
150	12	1			67.474.1						
200	12	1	1/8	*	190	67.535.1					
250	16	1	1/4	*	220	67.597.1					
300	20	1	1/4	*	220	67.597.1					
350	20	1	3/8	*	240	67.646.1					
400	20	1	1/2	*	250	67.688.1					

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

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	5/8	*	170	67.284.1
80	8	3/4	*	210	67.346.1
100	8	7/8	*	230	67.418.1
150	12	1	*	330	67.500.1
200	12	1 1/8	*	370	67.563.1
250	16	1 1/4	*	440	67.630.1
300	20	1 1/4	*	460	67.633.1
350	20	3/8	*	520	67.678.1
400	20	1 1/2	*	570	67.712.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.443.1
WELDING NECK FLANGE    1  76.62.86.152.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.444.1
WELDING NECK FLANGE    1  76.62.86.154.1

```

```

* DRAIN POINT                DN 20 FIG.DE   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
MONOFL SINGLE BLOCK BALL      1   77.00.95.444.1

```

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.043.1
WELDING NECK FLANGE       2  76.62.86.152.1
```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.043.1
WELDING NECK FLANGE               1  76.62.86.152.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
```

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.043.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
WELDING NECK FLANGE       1    76.62.86.152.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1

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* 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      81.38.67.334.1
THERMOWELL STRAIGHT      L=230 MM     1      76.83.37.121.1

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* 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      81.38.67.334.1
THERMOWELL STRAIGHT      L=255 MM    1      76.83.37.122.1

```

```

* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE       1  77.30.91.033.1
WELDING NECK FLANGE              1  76.62.86.152.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.034.1
WELDING NECK FLANGE         1  76.62.86.154.1

```

```

* VENT POINT                DN 20  FIG.DE   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
MONOFL SINGLE BLOCK NEEDLE 1    77.30.91.034.1

```

CLASS 61490

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -400	95.8	95.8	94.7	92.3	90.3	89.3

- 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.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	E	B	B	A		
200	C	C	C	C	E	E	E	B	B	A			
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	160
20	160
25	160
40	160
50	160
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 LOW TEMP.	PLANT :	
CLASS NO. : 61490	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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
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	MONEL 400 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	MONEL 400

PIPING COMPONENTS

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

* PIPE														
PIPE	74.30.17	023.1	030.1	038.1	054.1	063.1	069.1	077.1	086.1	098.1	110.1	122.1	135.1	144.1
* 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	262.1	264.1	266.1	268.1	270.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
* FITTINGS														
CAP BUTT-WELD.END	76.31.18	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1
ELBOW 45 DEG BUTT-WELD ENDS	76.31.38	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1
ELBOW 90 DEG BUTT-WELD ENDS	76.31.39	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1
EQUAL TEE BUTT-WELD ENDS	76.31.84	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1
* VALVES														
BALL VALVE FULL BORE TRUN FLGD	77.00.83					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1
BALL VALVE RED. BORE TRUN FLGD	77.00.83					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1
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
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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									
GLOBE VALVE FLANGED	77.30.33	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1					
MONOFL SINGLE BLOCK BALL	77.00.95	443.1	444.1	445.1	447.1	448.1								
* 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	76.64.96	072.1	074.1	076.1	078.1									
ORIFICE FLANGE SET	76.62.97					810.1	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		31.70.141.1	31.71.141.1	31.85.039.1	400* 50	79.06.194.1			
25* 15		31.70.151.1	31.71.151.1	31.85.049.1	400* 80	79.05.398.1			
25* 20		31.70.161.1	31.71.161.1	31.85.059.1	400*100	79.05.420.1			
40* 15		31.70.171.1	31.71.171.1	31.85.069.1	400*150	79.05.440.1	29.44.740.1	29.59.740.1	31.85.464.1
40* 20		31.70.181.1	31.71.181.1	31.85.079.1	400*200	79.05.458.1	31.70.455.1	31.71.455.1	31.85.481.1
40* 25		31.70.191.1	31.71.191.1	31.85.089.1	400*250	79.05.474.1	31.70.464.1	31.71.464.1	31.85.507.1
50* 20		31.70.195.1	31.71.195.1	31.85.098.1	400*300	79.05.488.1	31.70.475.1	31.71.475.1	31.85.533.1
50* 25		31.70.201.1	31.71.201.1	31.85.107.1	400*350	79.05.500.1	31.70.489.1	31.71.489.1	31.85.558.1
50* 40		31.70.211.1	31.71.211.1	31.85.116.1					
80* 40		31.70.229.1	31.71.229.1	31.85.129.1					
80* 50	79.06.180.1	31.70.238.1	31.71.238.1	31.85.138.1					
100* 40		31.70.253.1	31.71.253.1	31.85.147.1					
100* 50	79.06.182.1	31.70.268.1	31.71.268.1	31.85.159.1					
100* 80	79.05.386.1	31.70.277.1	31.71.277.1	31.85.166.1					
150* 50	79.06.184.1								
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	79.06.186.1								
200* 80	79.05.390.1								
200*100	79.05.412.1	31.70.327.1	31.71.327.1	31.85.206.1					
200*150	79.05.432.1	31.70.337.1	31.71.337.1	31.85.226.1					
250* 50	79.06.188.1								
250* 80	79.05.392.1								
250*100	79.05.414.1	31.70.345.1	31.71.345.1	31.85.254.1					
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	79.06.190.1								
300* 80	79.05.394.1								
300*100	79.05.416.1								
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	79.06.192.1								
350* 80	79.05.396.1								
350*100	79.05.418.1								
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	40-400	721.1	116.1
20	40-400	723.1	118.1
25	40-100	725.1	120.1
	150-400	726.1	124.1
40	50-100	730.1	126.1
	150-400	731.1	128.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
450	76.81.67.072.1	450	76.81.67.572.1
840	76.81.67.074.1	840	76.81.67.574.1
1230	76.81.67.076.1	1230	76.81.67.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.60.282.1	230	76.83.37.121.1
813	76.80.60.284.1	255	76.83.37.122.1
1219	76.80.60.286.1	305	76.83.37.123.1
1524	76.80.60.288.1	355	76.83.37.125.1
1829	76.80.60.290.1	405	76.83.37.126.1
2134	76.80.60.292.1	455	76.83.37.127.1
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

BOLTSET FLANGED JOINTS

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			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

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	5/8	* 170	63.284.1
80	8	3/4	* 210	63.346.1
100	8	7/8	* 230	63.418.1
150	12	1	* 330	63.500.1
200	12	1 1/8	* 370	63.563.1
250	16	1 1/4	* 440	63.628.1
300	20	1 1/4	* 460	63.637.1
350	20	3/8	* 520	63.667.1
400	20	1 1/2	* 570	63.714.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.443.1
WELDING NECK FLANGE  1  76.62.86.262.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.444.1
WELDING NECK FLANGE    1  76.62.86.264.1

```

```

* DRAIN POINT          DN 20 FIG.DE   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
MONOFL SINGLE BLOCK BALL 1  77.00.95.444.1

```

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.043.1
WELDING NECK FLANGE       2  76.62.86.262.1
```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB  DN 15 - 40
Branch:N (:N=br.tab;:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.043.1
WELDING NECK FLANGE               1  76.62.86.262.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.043.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
WELDING NECK FLANGE       1    76.62.86.262.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1

```

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* 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  76.83.37.121.1

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```
* 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   76.83.37.122.1
```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.033.1
WELDING NECK FLANGE        1  76.62.86.262.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.034.1
WELDING NECK FLANGE        1  76.62.86.264.1

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```

* VENT POINT                DN 20 FIG.DE    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
MONOFL SINGLE BLOCK NEEDLE  1    77.30.91.034.1

```


CLASS 61500

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 0 50 75 100 120

PRESSURE BAR GA
DN15 -400 95.8 95.8 94.7 92.3 90.3 89.3

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.
COLD BENDING IS NOT ALLOWED.
- 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
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	E	B	B	A		
200	C	C	C	C	E	E	E	E	B	B	A		
150	C	C	C	C	E	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	160
20	160
25	160
40	160
50	160
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 LOW TEMP. SOUR	PLANT :	
CLASS NO. : 61500	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-350	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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
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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE															
PIPE	74.30.16	023.1	030.1	038.1	054.1	063.1	069.1	077.1	086.1	098.1	110.1	122.1	135.1	144.1	
* 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	76.88.35	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)	76.88.47	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	262.1	264.1	266.1	268.1	270.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	
* FITTINGS															
CAP BUTT-WELD.END	76.31.17	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1	
EQUAL TEE BUTT-WELD ENDS	76.31.80	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1	
* VALVES															
BALL VALVE FULL BORE TRUN FLGD	77.00.83					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.83					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	
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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					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										
GLOBE VALVE FLANGED	77.30.33	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1						
MONOFL SINGLE BLOCK BALL	77.00.95	443.1	444.1	445.1	447.1	448.1									
* 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	76.64.96	072.1	074.1	076.1	078.1										
ORIFICE FLANGE SET	76.62.97					810.1	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		31.66.141.1	31.75.141.1	31.88.039.1	400* 50	79.06.194.1			
25* 15		31.66.151.1	31.75.151.1	31.88.049.1	400* 80	79.05.398.1			
25* 20		31.66.161.1	31.75.161.1	31.88.059.1	400*100	79.05.420.1			
40* 15		31.66.171.1	31.75.171.1	31.88.069.1	400*150	79.05.440.1	29.45.740.1	29.60.740.1	31.88.464.1
40* 20		31.66.181.1	31.75.181.1	31.88.079.1	400*200	79.05.458.1	31.66.455.1	31.75.455.1	31.88.481.1
40* 25		31.66.191.1	31.75.191.1	31.88.089.1	400*250	79.05.474.1	31.66.464.1	31.75.464.1	31.88.507.1
50* 20		31.66.195.1	31.75.195.1	31.88.098.1	400*300	79.05.488.1	31.66.475.1	31.75.475.1	31.88.533.1
50* 25		31.66.201.1	31.75.201.1	31.88.107.1	400*350	79.05.500.1	31.66.489.1	31.75.489.1	31.88.558.1
50* 40		31.66.211.1	31.75.211.1	31.88.116.1					
80* 40		31.66.229.1	31.75.229.1	31.88.129.1					
80* 50	79.06.180.1	31.66.238.1	31.75.238.1	31.88.138.1					
100* 40		31.66.253.1	31.75.253.1	31.88.147.1					
100* 50	79.06.182.1	31.66.268.1	31.75.268.1	31.88.159.1					
100* 80	79.05.386.1	31.66.277.1	31.75.277.1	31.88.166.1					
150* 50	79.06.184.1								
150* 80	79.05.388.1	31.66.297.1	31.75.297.1	31.88.178.1					
150*100	79.05.410.1	31.66.307.1	31.75.307.1	31.88.190.1					
200* 50	79.06.186.1								
200* 80	79.05.390.1								
200*100	79.05.412.1	31.66.327.1	31.75.327.1	31.88.206.1					
200*150	79.05.432.1	31.66.337.1	31.75.337.1	31.88.226.1					
250* 50	79.06.188.1								
250* 80	79.05.392.1								
250*100	79.05.414.1	31.66.345.1	31.75.345.1	31.88.254.1					
250*150	79.05.434.1	31.66.358.1	31.75.358.1	31.88.272.1					
250*200	79.05.452.1	31.66.367.1	31.75.367.1	31.88.293.1					
300* 50	79.06.190.1								
300* 80	79.05.394.1								
300*100	79.05.416.1								
300*150	79.05.436.1	31.66.385.1	31.75.385.1	31.88.311.1					
300*200	79.05.454.1	31.66.397.1	31.75.397.1	31.88.330.1					
300*250	79.05.470.1	31.66.408.1	31.75.408.1	31.88.352.1					
350* 50	79.06.192.1								
350* 80	79.05.396.1								
350*100	79.05.418.1								
350*150	79.05.438.1	31.66.415.1	31.75.415.1	31.88.374.1					
350*200	79.05.456.1	31.66.424.1	31.75.424.1	31.88.392.1					
350*250	79.05.472.1	31.66.439.1	31.75.439.1	31.88.417.1					
350*300	79.05.486.1	31.66.449.1	31.75.449.1	31.88.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	721.1	116.1
20	40-400	723.1	118.1
25	40-100	725.1	120.1
	150-400	726.1	124.1
40	50-100	730.1	126.1
	150-400	731.1	128.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
450	76.81.68.072.1	450	76.81.68.572.1
840	76.81.68.074.1	840	76.81.68.574.1
1230	76.81.68.076.1	1230	76.81.68.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
356	76.80.60.622.1	230	76.83.37.121.1
813	76.80.60.624.1	255	76.83.37.122.1
1219	76.80.60.626.1	305	76.83.37.123.1
1524	76.80.60.628.1	355	76.83.37.125.1
1829	76.80.60.630.1	405	76.83.37.126.1
2134	76.80.60.632.1	455	76.83.37.127.1
2438	76.80.60.634.1		
2743	76.80.60.636.1		
3048	76.80.60.638.1		

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

BOLTSET FLANGED JOINTS

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	1/2	* 80	67.157.1	15	4	1/2	* 80	67.157.1
20	4	5/8	* 90	67.271.1	20	4	5/8	* 90	67.271.1
25	4	5/8	* 90	67.271.1	25	4	5/8	* 90	67.271.1
40	4	3/4	* 110	67.330.1	40	4	3/4	* 110	67.330.1
50	8	5/8	* 110	67.274.1					
80	8	3/4	* 130	67.334.1					
100	8	7/8	* 150	67.406.1					
150	12	1	* 170	67.474.1					
200	12	1	1/8 * 190	67.535.1					
250	16	1	1/4 * 220	67.597.1					
300	20	1	1/4 * 220	67.597.1					
350	20	1	3/8 * 240	67.646.1					
400	20	1	1/2 * 250	67.688.1					

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	67.281.1		50	8	5/8	*	120
80	8	3/4	*	150	67.337.1		80	8	3/4	*	150
100	8	7/8	*	160	67.407.1	100	8	7/8	*	170	67.409.1
150	12	1	*	180	67.475.1	150	12	1	*	210	67.480.1
200	12	1 1/8	*	210	67.538.1	200	12	1 1/8	*	230	67.541.1
250	16	1 1/4	*	230	67.598.1	250	16	1 1/4	*	260	67.603.1
300	20	1 1/4	*	240	67.600.1	300	20	1 1/4	*	270	67.605.1
350	20	1 3/8	*	260	67.649.1	350	20	1 3/8	*	290	67.654.1
400	20	1 1/2	*	280	67.693.1	400	20	1 1/2	*	310	67.698.1

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	5/8	*	170	67.284.1
80	8	3/4	*	210	67.346.1
100	8	7/8	*	230	67.418.1
150	12	1	*	330	67.500.1
200	12	1 1/8	*	370	67.563.1
250	16	1 1/4	*	440	67.630.1
300	20	1 1/4	*	460	67.633.1
350	20	3/8	*	520	67.678.1
400	20	1/2	*	570	67.712.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING.COM.)
BLIND FLANGE          1  76.62.12.558.1
GASKET, SPIRAL WOUND  2  85.41.46.104.1
MONOFL SINGLE BLOCK BALL  1  77.00.95.443.1
WELDING NECK FLANGE  1  76.62.86.262.1

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```
* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING.COM.)
BLIND FLANGE          1  76.62.12.562.1
GASKET, SPIRAL WOUND  2  85.41.46.106.1
MONOFL SINGLE BLOCK BALL  1  77.00.95.444.1
WELDING NECK FLANGE   1  76.62.86.264.1
```

* DRAIN POINT	DN 20	FIG.DE	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	14.6106	1
MONOFL SINGLE BLOCK BALL	1	77.00	95.444	1

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.043.1
WELDING NECK FLANGE       2  76.62.86.262.1

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```
* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.043.1
WELDING NECK FLANGE      1    76.62.86.262.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.043.1

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```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1
WELDING NECK FLANGE       1    76.62.86.262.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.043.1

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* 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      81.38.67.334.1
THERMOWELL STRAIGHT      L=230 MM    1      76.83.37.121.1

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* 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      81.38.67.334.1
THERMOWELL STRAIGHT      L=255 MM    1      76.83.37.122.1

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30,91.033.1
WELDING NECK FLANGE         1  76.62,86.262.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.034.1
WELDING NECK FLANGE         1  76.62.86.264.1

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```

* VENT POINT                DN 20  FIG.DE   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
MONOFL SINGLE BLOCK NEEDLE 1    77.30.91.034.1

```

CLASS 61501

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -400	95.8	95.8	94.7	92.3	90.3	89.3

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	B	B	B	B	A	
250	C	C	C	C	E	E	E	B	B	B	A		
200	C	C	C	C	E	E	E	B	B	B	A		
150	C	C	C	C	E	E	B	B	A				
100	C	C	C	C	B	B	B	A					
80	C	C	C	B	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	160
20	160
25	160
40	160
50	160
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 LOW TEMP. SOUR	PLANT :	
CLASS NO. : 61501	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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
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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE															
PIPE	74.30.16	023.1	030.1	038.1	054.1	063.1	069.1	077.1	086.1	098.1	110.1	122.1	135.1	144.1	
* 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	76.88.35	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)	76.88.47	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	262.1	264.1	266.1	268.1	270.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	
* FITTINGS															
CAP BUTT-WELD.END	76.31.17	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1	
EQUAL TEE BUTT-WELD ENDS	76.31.80	172.1	178.1	182.1	192.1	212.1	230.1	248.1	268.1	288.1	310.1	332.1	352.1	372.1	
* VALVES															
BALL VALVE FULL BORE TRUN FLGD	77.00.93					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.93					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	
CHECK VALVE FLANGED	77.10.44	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.58					108.1	110.1	112.1	114.1	115.1	116.1	117.1	118.1	119.1	
GATE VALVE FLANGED	77.20.54	103.1	104.1	105.1	107.1										
GLOBE VALVE FLANGED	77.30.54	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1						
MONOFL SINGLE BLOCK BALL	77.00.97	443.1	444.1	445.1	447.1	448.1									
* 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	76.64.96	072.1	074.1	076.1	078.1										
ORIFICE FLANGE SET	76.62.97					810.1	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		31.66.141.1	31.75.141.1	31.88.039.1	400* 50	79.06.194.1			
25* 15		31.66.151.1	31.75.151.1	31.88.049.1	400* 80	79.05.398.1			
25* 20		31.66.161.1	31.75.161.1	31.88.059.1	400*100	79.05.420.1			
40* 15		31.66.171.1	31.75.171.1	31.88.069.1	400*150	79.05.440.1	29.45.740.1	29.60.740.1	31.88.464.1
40* 20		31.66.181.1	31.75.181.1	31.88.079.1	400*200	79.05.458.1	31.66.455.1	31.75.455.1	31.88.481.1
40* 25		31.66.191.1	31.75.191.1	31.88.089.1	400*250	79.05.474.1	31.66.464.1	31.75.464.1	31.88.507.1
50* 20		31.66.195.1	31.75.195.1	31.88.098.1	400*300	79.05.488.1	31.66.475.1	31.75.475.1	31.88.533.1
50* 25		31.66.201.1	31.75.201.1	31.88.107.1	400*350	79.05.500.1	31.66.489.1	31.75.489.1	31.88.558.1
50* 40		31.66.211.1	31.75.211.1	31.88.116.1					
80* 40		31.66.229.1	31.75.229.1	31.88.129.1					
80* 50	79.06.180.1	31.66.238.1	31.75.238.1	31.88.138.1					
100* 40		31.66.253.1	31.75.253.1	31.88.147.1					
100* 50	79.06.182.1	31.66.268.1	31.75.268.1	31.88.159.1					
100* 80	79.05.386.1	31.66.277.1	31.75.277.1	31.88.166.1					
150* 50	79.06.184.1								
150* 80	79.05.388.1	31.66.297.1	31.75.297.1	31.88.178.1					
150*100	79.05.410.1	31.66.307.1	31.75.307.1	31.88.190.1					
200* 50	79.06.186.1								
200* 80	79.05.390.1								
200*100	79.05.412.1	31.66.327.1	31.75.327.1	31.88.206.1					
200*150	79.05.432.1	31.66.337.1	31.75.337.1	31.88.226.1					
250* 50	79.06.188.1								
250* 80	79.05.392.1								
250*100	79.05.414.1	31.66.345.1	31.75.345.1	31.88.254.1					
250*150	79.05.434.1	31.66.358.1	31.75.358.1	31.88.272.1					
250*200	79.05.452.1	31.66.367.1	31.75.367.1	31.88.293.1					
300* 50	79.06.190.1								
300* 80	79.05.394.1								
300*100	79.05.416.1								
300*150	79.05.436.1	31.66.385.1	31.75.385.1	31.88.311.1					
300*200	79.05.454.1	31.66.397.1	31.75.397.1	31.88.330.1					
300*250	79.05.470.1	31.66.408.1	31.75.408.1	31.88.352.1					
350* 50	79.06.192.1								
350* 80	79.05.396.1								
350*100	79.05.418.1								
350*150	79.05.438.1	31.66.415.1	31.75.415.1	31.88.374.1					
350*200	79.05.456.1	31.66.424.1	31.75.424.1	31.88.392.1					
350*250	79.05.472.1	31.66.439.1	31.75.439.1	31.88.417.1					
350*300	79.05.486.1	31.66.449.1	31.75.449.1	31.88.443.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-400	721.1	116.1
20	40-400	723.1	118.1
25	40-100	725.1	120.1
	150-400	726.1	124.1
40	50-100	730.1	126.1
	150-400	731.1	128.1

LEVEL GAUGE THROUGH-VISION		LEVEL GAUGE REFLEX	
LENGTH	MESCNBER	LENGTH	MESCNBER
-----	-----	-----	-----
450	76.81.68.072.1	450	76.81.68.572.1
840	76.81.68.074.1	840	76.81.68.574.1
1230	76.81.68.076.1	1230	76.81.68.576.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNBER	LENGTH	MESCNBER
-----	-----	-----	-----
356	76.80.60.622.1	230	76.83.37.121.1
813	76.80.60.624.1	255	76.83.37.122.1
1219	76.80.60.626.1	305	76.83.37.123.1
1524	76.80.60.628.1	355	76.83.37.125.1
1829	76.80.60.630.1	405	76.83.37.126.1
2134	76.80.60.632.1	455	76.83.37.127.1
2438	76.80.60.634.1		
2743	76.80.60.636.1		
3048	76.80.60.638.1		

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

BOLTSET FLANGED JOINTS

81.38					81.38						
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM		
15	4	1/2	*	80	67.157.1	15	4	1/2	*	80	67.157.1
20	4	5/8	*	90	67.271.1	20	4	5/8	*	90	67.271.1
25	4	5/8	*	90	67.271.1	25	4	5/8	*	90	67.271.1
40	4	3/4	*	110	67.330.1	40	4	3/4	*	110	67.330.1
50	8	5/8	*	110	67.274.1						
80	8	3/4	*	130	67.334.1						
100	8	7/8	*	150	67.406.1						
150	12	1			67.474.1						
200	12	1	1/8	*	190	67.535.1					
250	16	1	1/4	*	220	67.597.1					
300	20	1	1/4	*	220	67.597.1					
350	20	1	3/8	*	240	67.646.1					
400	20	1	1/2	*	250	67.688.1					

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

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	5/8	*	170	67.284.1
80	8	3/4	*	210	67.346.1
100	8	7/8	*	230	67.418.1
150	12	1	*	330	67.500.1
200	12	1 1/8	*	370	67.563.1
250	16	1 1/4	*	440	67.630.1
300	20	1 1/4	*	460	67.633.1
350	20	3/8	*	520	67.678.1
400	20	1 1/2	*	570	67.712.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.443.1
WELDING NECK FLANGE    1  76.62.86.262.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.444.1
WELDING NECK FLANGE    1  76.62.86.264.1

```

```

* DRAIN POINT          DN 20  FIG.DE  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.444.1

```

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.343.1
WELDING NECK FLANGE        2  76.62.86.262.1

```

```

* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD    1    77.85.47.343.1
WELDING NECK FLANGE               1    76.62.86.262.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.343.1
```

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.343.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.343.1
WELDING NECK FLANGE       1  76.62.86.262.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.343.1

```

```

* 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      81.38.67.334.1
THERMOWELL STRAIGHT      L=230 MM    1      76.83.37.121.1

```

```

* 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  81.38.67.334.1
THERMOWELL STRAIGHT      L=255 MM    1  76.83.37.122.1

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.92.033.1
WELDING NECK FLANGE        1  76.62.86.262.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.92.034.1
WELDING NECK FLANGE        1  76.62.86.264.1

```

```

* VENT POINT                DN 20  FIG.DE   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
MONOFL SINGLE BLOCK NEEDLE 1   77.30.92.034.1

```

CLASS 63410

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-20	0	50	75	100	120	
PRESSURE BAR GA						
DN15 -200	99.2	99.2	96.2	90.0	84.5	81.5

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
- FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- FOR BENDING OF PIPE SEE 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.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	15	20	25	40	50	80	100	150
200	C	C	C	C	E	E	B	B A
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	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.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 63410	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 63410, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE PIPE DN 15-200 ASTM A312-TP316L

* FLANGES

BLFL BLIND FLANGE DN 15-200 ASTM A182-F316
COFL COVER FLANGE THERMOWELL NOZZLE --- 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

BTFB BALL VALVE FULL BORE TRUN FLGD DN 50-200 BODY: ASTM A182-F316/A351-CF8M
TRIM: AISI 316 (L), NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD DN 50-200 BODY: ASTM A182-F316/A351-CF8M
TRIM: AISI 316 (L), NYLON
CHVF CHECK VALVE FLANGED DN 15-200 BODY: ASTM A351-CF8M, A182-F316
TRIM: AISI 316 (L), STELLITE 6
CHWL DUAL PL. CHECK VALVE WAFER LUG DN 50-200 BODY: ASTM A351-CF8M, A182-F316
TRIM: AISI 316 (L), STELLITE 6
GAVF GATE VALVE FLANGED DN 15- 40 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
MSBF MONOFL SINGLE BLOCK BALL DN 15- 50 BODY: ASTM A182-F316, A351-CF8M
TRIM: AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE --- BODY: ASTM A182-F316, A351-CF8M
TRIM: AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD --- BODY: ASTM A182-F316, A351-CF8M
TRIM: AISI 316

* 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 MONEL 400
LJ END FLANGES: ASTM A350-LF2
ORFS ORIFICE FLANGE SET DN 50-200 ASTM A182-F316
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 : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	058.1	066.1	074.1	085.1	097.1
* 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										
BALL VALVE FULL BORE TRUN FLGD	77.03.74					608.1	610.1	612.1	614.1	615.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74					108.1	110.1	112.1	114.1	115.1
CHECK VALVE FLANGED	77.13.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					108.1	110.1	112.1	114.1	115.1
GATE VALVE FLANGED	77.23.03	103.1	104.1	105.1	107.1					
GLOBE VALVE FLANGED	77.33.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	
MONOFL SINGLE BLOCK BALL	77.03.90	143.1	144.1	145.1	147.1	148.1				
* 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	76.64.96	072.1	074.1	076.1	078.1					
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 MESCNUMBER	LENGTH MESCNUMBER
-----	-----
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 MESCNUMBER	LENGTH MESCNUMBER
-----	-----
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
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

2134	76.80.61.492.1	455	76.83.37.127.1
2438	76.80.61.494.1		
2743	76.80.61.496.1		
3048	76.80.61.498.1		

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						

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	

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	* MM		

50	8	5/8	* 170	61.284.1	
80	8	3/4	* 210	61.346.1	
100	8	7/8	* 230	61.418.1	
150	12	1	* 330	61.500.1	
200	12	1	1/8 * 370	61.563.1	

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.03.90.143.1
WELDING NECK FLANGE  1  76.65.80.482.1

```

```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.144.1
WELDING NECK FLANGE    1  76.65.80.484.1
```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.03.90.144.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -200
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.543.1
WELDING NECK FLANGE       2  76.65.80.482.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.543.1
WELDING NECK FLANGE               1  76.65.80.482.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.543.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1
WELDING NECK FLANGE       1    76.65.80.482.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1

```

```

* 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      76.83.37.121.1

```

```
* 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   76.83.37.122.1
```

```

* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE        1  77.33.93.033.1
WELDING NECK FLANGE               1  76.65.80.482.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.93.034.1
WELDING NECK FLANGE         1  76.65.80.484.1

```

* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.034.1	

CLASS 63420

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-20	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -200	99.1	99.1	96.1	89.9	84.5	81.5

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - 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
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	B	B A
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	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.

STAINLESS STEEL AISI 316, SOUR	PLANT :	
CLASS NO. : 63420	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 63420, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316 (L), NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316 (L), NYLON
CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L), STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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-B7M/A194-2HM
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A193-B7M/A194-2HM
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 63420, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	058.1	066.1	074.1	085.1	097.1
* 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										
BALL VALVE FULL BORE TRUN FLGD	77.03.74					608.1	610.1	612.1	614.1	615.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74					108.1	110.1	112.1	114.1	115.1
CHECK VALVE FLANGED	77.13.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					108.1	110.1	112.1	114.1	115.1
GATE VALVE FLANGED	77.23.03	103.1	104.1	105.1	107.1					
GLOBE VALVE FLANGED	77.33.03	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	
MONOFL SINGLE BLOCK BALL	77.03.90	143.1	144.1	145.1	147.1	148.1				
* 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	76.64.96	072.1	074.1	076.1	078.1					
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 MESCNUMBER	LENGTH MESCNUMBER
450	76.81.71.072.1
840	76.81.71.074.1
1230	76.81.71.076.1
450	76.81.71.572.1
840	76.81.71.574.1
1230	76.81.71.576.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
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
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

2134	76.80.61.492.1	455	76.83.37.127.1
2438	76.80.61.494.1		
2743	76.80.61.496.1		
3048	76.80.61.498.1		

BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM		
15	4	1/2	*	80	66.157.1	15	4	1/2	*	80	66.157.1
20	4	5/8	*	90	66.271.1	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	*	110	66.330.1	40	4	3/4	*	110	66.330.1
50	8	5/8	*	110	66.274.1						
80	8	3/4	*	130	66.334.1						
100	8	7/8	*	150	66.406.1						
150	12	1	*	170	66.474.1						
200	12	1	1/8	* 190	66.535.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

					81.38						81.38	
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		
							15	4	1/2	*	90	66.159.1
							20	4	5/8	*	100	66.273.1
							25	4	5/8	*	100	66.273.1
							40	4	3/4	*	120	66.332.1
50	8	5/8	*	150	66.281.1		50	8	5/8	*	120	66.276.1
80	8	3/4	*	150	66.337.1		80	8	3/4	*	150	66.337.1
100	8	7/8	*	160	66.407.1	100	8	7/8	*	170	66.409.1	
150	12	1	*	180	66.475.1	150	12	1	*	210	66.480.1	
200	12	1	1/8	* 210	66.538.1	200	12	1	1/8	* 230	66.541.1	

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	5/8	* 170	66.284.1
80	8	3/4	* 210	66.346.1
100	8	7/8	* 230	66.418.1
150	12	1	* 330	66.500.1
200	12	1	1/8 * 370	66.563.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.143.1
WELDING NECK FLANGE    1  76.65.80.482.1

```

```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.144.1
WELDING NECK FLANGE    1  76.65.80.484.1
```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.03.90.144.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -200
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.543.1
WELDING NECK FLANGE       2  76.65.80.482.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.543.1
WELDING NECK FLANGE               1  76.65.80.482.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.543.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1
WELDING NECK FLANGE       1    76.65.80.482.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1

```

```

* 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                  1  76.83.37.121.1
                                L=230 MM

```

```

* 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   81.38.66.334.1
THERMOWELL STRAIGHT                   1   76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.93.033.1
WELDING NECK FLANGE         1  76.65.80.482.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.93.034.1
WELDING NECK FLANGE         1  76.65.80.484.1

```

* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.034.1	

CLASS 63430

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS								
	-20	0	50	75	100	120	150	200
PRESSURE BAR GA								
DN15 -200	99.2	99.2	96.2	90.0	84.5	81.5	77.0	71.1

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
- FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150
200	C	C	C	C	E	E	B	B A
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	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.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 63430	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 63430, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 63430, REV.B PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	058.1	066.1	074.1	085.1	097.1
* 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
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					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	76.64.96	072.1	074.1	076.1	078.1					
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 MESCNUMBER	LENGTH MESCNUMBER
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 MESCNUMBER	LENGTH MESCNUMBER
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
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

2134	76.80.61.492.1	455	76.83.37.127.1
2438	76.80.61.494.1		
2743	76.80.61.496.1		
3048	76.80.61.498.1		

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						

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

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	5/8	* 170	61.284.1
80	8	3/4	* 210	61.346.1
100	8	7/8	* 230	61.418.1
150	12	1	* 330	61.500.1
200	12	1/8	* 370	61.563.1

ASSEMBLIES

DRAIN POINT	DN 15	FIG.01	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.OI	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

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```
* ORIFICE INSTR.CONN.      DN 15  FIG.OI      DN 50 -200
Branch: ( :N=br.tab. :S=BNIF, :N/A) 1(PIPING.COM.)
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
```

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* PRESSURE INSTR.CONN.      DN 15  FIG.01      DN 15 - 40
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

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* PRESSURE INSTR.CONN.      DN 15  FIG.01      DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING.COM.)
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

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```
* 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   76.83.37.121.1

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* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -200
Branch:S (N=br.tab,S=BNIF,N=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                   1   76.83.37.122.1
                                L=255 MM

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* VENT POINT                DN 15  FIG.11  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

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```

* 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

```

CLASS 63450

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-100	0	50	75	100	120	
PRESSURE BAR GA						
DN15 -200	99.2	99.2	96.2	90.0	84.5	81.5

- NOTES
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	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	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	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.

STAINLESS STEEL LOW TEMP.	PLANT :	
CLASS NO. : 63450	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	---	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316

* 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 A320-L7/A194-4
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A320-L7/A194-4
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWGS	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	058.1	066.1	074.1	085.1	097.1
* 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										
BALL VALVE FULL BORE TRUN FLGD	77.03.73					608.1	610.1	612.1	614.1	615.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73					108.1	110.1	112.1	114.1	115.1
CHECK VALVE FLANGED	77.13.19	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					108.1	110.1	112.1	114.1	115.1
GATE VALVE FLANGED	77.23.05	103.1	104.1	105.1	107.1					
GLOBE VALVE FLANGED	77.33.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	
MONOFL SINGLE BLOCK BALL	77.03.90	043.1	044.1	045.1	047.1	048.1				
* 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	76.64.96	022.1	024.1	026.1	028.1					
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 MESCNUMBER	LENGTH MESCNUMBER
450	76.81.72.072.1
840	76.81.72.074.1
1230	76.81.72.076.1
450	76.81.72.572.1
840	76.81.72.574.1
1230	76.81.72.576.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
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
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

2134	76.80.61.492.1	455	76.83.37.127.1
2438	76.80.61.494.1		
2743	76.80.61.496.1		
3048	76.80.61.498.1		

BOLTSET FLANGED JOINTS

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						

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	

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	5/8	* 170	63.284.1
80	8	3/4	* 210	63.346.1
100	8	7/8	* 230	63.418.1
150	12	1	* 330	63.500.1
200	12	1	1/8 * 370	63.563.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.043.1
WELDING NECK FLANGE    1  76.65.80.482.1

```

```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.044.1
WELDING NECK FLANGE    1  76.65.80.484.1
```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.03.90.044.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -200
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.443.1
WELDING NECK FLANGE       2  76.65.80.482.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB  DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.443.1
WELDING NECK FLANGE      1  76.65.80.482.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.443.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.443.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.443.1
WELDING NECK FLANGE       1    76.65.80.482.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.443.1

```

```

* 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  76.65.60.785.1
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  76.83.37.121.1

```

```

* 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   76.65.60.785.1
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   76.83.37.122.1

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.92.033.1
WELDING NECK FLANGE         1  76.65.80.482.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.92.034.1
WELDING NECK FLANGE         1  76.65.80.484.1

```

```

* VENT POINT                DN 20  FIG.DE   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
MONOFL SINGLE BLOCK NEEDLE  1   77.33.92.034.1

```

CLASS 63460

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-73	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -200	99.1	99.1	96.1	89.9	84.5	81.5

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	B	B A
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	40S
40	40S
50	40S
80	40S
100	40S
150	80S
200	80S

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.

STAINLESS STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 63460	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 63460, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	---	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316

* 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 A320-L7M/A194-7M
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: AISI 316 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	058.1	066.1	074.1	085.1	097.1
* 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										
BALL VALVE FULL BORE TRUN FLGD	77.03.73					608.1	610.1	612.1	614.1	615.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73					108.1	110.1	112.1	114.1	115.1
CHECK VALVE FLANGED	77.13.19	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	115.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					108.1	110.1	112.1	114.1	115.1
GATE VALVE FLANGED	77.23.05	103.1	104.1	105.1	107.1					
GLOBE VALVE FLANGED	77.33.05	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1	
MONOFL SINGLE BLOCK BALL	77.03.90	143.1	144.1	145.1	147.1	148.1				
* 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	76.64.96	022.1	024.1	026.1	028.1					
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 MESCNUMBER	LENGTH MESCNUMBER
450	76.81.73.072.1
840	76.81.73.074.1
1230	76.81.73.076.1
450	76.81.73.572.1
840	76.81.73.574.1
1230	76.81.73.576.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
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
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

2134	76.80.61.492.1	455	76.83.37.127.1
2438	76.80.61.494.1		
2743	76.80.61.496.1		
3048	76.80.61.498.1		

BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38						
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM		
15	4	1/2	*	80	67.157.1	15	4	1/2	*	80	67.157.1
20	4	5/8	*	90	67.271.1	20	4	5/8	*	90	67.271.1
25	4	5/8	*	90	67.271.1	25	4	5/8	*	90	67.271.1
40	4	3/4	*	110	67.330.1	40	4	3/4	*	110	67.330.1
50	8	5/8	*	110	67.274.1						
80	8	3/4	*	130	67.334.1						
100	8	7/8	*	150	67.406.1						
150	12	1	*	170	67.474.1						
200	12	1	1/8	* 190	67.535.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

					81.38						81.38	
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		
							15	4	1/2	*	90	67.159.1
							20	4	5/8	*	100	67.273.1
							25	4	5/8	*	100	67.273.1
							40	4	3/4	*	120	67.332.1
50	8	5/8	*	150	67.281.1		50	8	5/8	*	120	67.276.1
80	8	3/4	*	150	67.337.1		80	8	3/4	*	150	67.337.1
100	8	7/8	*	160	67.407.1	100	8	7/8	*	170	67.409.1	
150	12	1	*	180	67.475.1	150	12	1	*	210	67.480.1	
200	12	1 1/8	*	210	67.538.1	200	12	1 1/8	*	230	67.541.1	

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM		81.38
50	8	5/8	* 170	67.284.1	
80	8	3/4	* 210	67.346.1	
100	8	7/8	* 230	67.418.1	
150	12	1	* 330	67.500.1	
200	12	1	1/8 * 370	67.563.1	

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.03.90.143.1
WELDING NECK FLANGE  1  76.65.80.482.1

```

```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.144.1
WELDING NECK FLANGE    1  76.65.80.484.1
```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.03.90.144.1		

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -200
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.543.1
WELDING NECK FLANGE       2  76.65.80.482.1
```

```

* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.543.1
WELDING NECK FLANGE               1  76.65.80.482.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1
```

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```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.543.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1
WELDING NECK FLANGE       1    76.65.80.482.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.543.1

```

```

* 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      76.65.60.785.1
GASKET, SPIRAL WOUND                 1      85.41.46.112.1
STUD BOLT WITH NUTS                  4      81.38.67.334.1
THERMOWELL STRAIGHT      L=230 MM    1      76.83.37.121.1

```

```

* 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  76.65.60.785.1
GASKET, SPIRAL WOUND                1  85.41.46.112.1
STUD BOLT WITH NUTS                  4  81.38.67.334.1
THERMOWELL STRAIGHT      L=255 MM    1  76.83.37.122.1

```

```

* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE       1  77.33.93.033.1
WELDING NECK FLANGE              1  76.65.80.482.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.93.034.1
WELDING NECK FLANGE         1  76.65.80.484.1

```

* VENT POINT	DN 20	FIG.DE	DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,:=N/A)	1	76.65	10.464.1
BLIND FLANGE	1	76.65	10.464.1
GASKET, SPIRAL WOUND	2	85.41	14.6106.1
MONOFL SINGLE BLOCK NEEDLE	1	77.33	93.034.1

CLASS 63831

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 0 50 75 100 120

PRESSURE BAR GA
DN15 -600 103.4 103.4 102.5 100.6 98.3 95.6

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
- FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST

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	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	B	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	E	B	B	A							150	40S
150	C	C	C	C	E	B	B	A									200	40S
100	C	C	C	C	B	B	B	A									250	40S
80	C	C	C	B	B	B	A										300	40S
50	C	B	B	B	B	A											350	40
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803	PLANT :	
CLASS NO. : 63831	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPD	PIPE (WELDED)	DN250-600	ASTM A928-CL1 UNS S31803
PIPE	PIPE	DN 15-200	ASTM A790 UNS S31803

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL	SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL	SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL	WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
		DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
		DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB	BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
		DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
		DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-600	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR	LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT	LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR	METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

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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 (WELDED)	74.36.57										169.1	185.1	203.1	218.1	236.1	251.1	266.1
PIPE	74.36.58	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1							
* FLANGES																	
BLIND FLANGE	76.66.01	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	103.1	104.1	106.1	108.1	110.1
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	332.1	334.1	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
WELDING NECK FLANGE	76.66.29	452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1	470.1	472.1	476.1	478.1	480.1	482.1	484.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					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 FLANGED	77.13.41	103.1	104.1	105.1	107.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.23.41	103.1	104.1	105.1	107.1												
GLOBE VALVE FLANGED	77.33.41	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
MONOFL SINGLE BLOCK BALL	77.03.92	443.1	444.1	445.1	447.1	448.1											
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.43.58	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	642.1	644.1	646.1	648.1												
ORIFICE FLANGE SET	76.66.90					542.1	544.1	594.1	596.1	598.1	600.1	602.1	834.1	835.1	836.1	837.1	838.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.49.842.1			
25* 15		36.43.021.1	36.58.021.1	36.83.021.1	400* 80	78.49.856.1			
25* 20		36.43.037.1	36.58.037.1	36.83.037.1	400*100	78.49.867.1			
40* 15		36.43.053.1	36.58.053.1	36.83.053.1	400*150	78.49.877.1			
40* 20		36.43.071.1	36.58.071.1	36.83.071.1	400*200		36.43.640.1	36.58.640.1	36.83.640.1
40* 25		36.43.087.1	36.58.087.1	36.83.087.1	400*250		36.43.660.1	36.58.660.1	36.83.659.1
50* 20		36.43.103.1	36.58.103.1	36.83.103.1	400*300		36.43.676.1	36.58.676.1	36.83.668.1
50* 25		36.43.121.1	36.58.121.1	36.83.121.1	400*350		36.43.686.1	36.58.686.1	36.83.686.1
50* 40		36.43.137.1	36.58.137.1	36.83.137.1	450* 50	78.49.843.1			
80* 40		36.43.153.1	36.58.153.1	36.83.153.1	450* 80	78.49.857.1			
80* 50		36.43.171.1	36.58.171.1	36.83.171.1	450*100	78.49.868.1			
100* 40		36.43.187.1	36.58.187.1	36.83.187.1	450*150	78.49.878.1			
100* 50		36.43.206.1	36.58.206.1	36.83.206.1	450*200				36.83.709.1
100* 80		36.43.225.1	36.58.225.1	36.83.225.1	450*250		36.43.726.1	36.58.726.1	36.83.725.1
150* 50	78.49.632.1				450*300		36.43.743.1	36.58.743.1	36.83.734.1
150* 80		36.43.244.1	36.58.244.1	36.83.244.1	450*350		36.43.752.1	36.58.752.1	36.83.752.1
150*100		36.43.261.1	36.58.261.1	36.83.261.1	450*400		36.43.769.1	36.58.769.1	36.83.769.1
200* 50	78.49.633.1				500* 50	78.49.844.1			
200* 80	78.49.639.1				500* 80	78.49.858.1			
200*100		36.43.281.1	36.58.281.1	36.83.281.1	500*100	78.49.869.1			
200*150		36.43.305.1	36.58.305.1	36.83.305.1	500*150	78.49.879.1			
250* 50	78.49.634.1				500*200	78.49.888.1			
250* 80	78.49.640.1				500*250				36.83.811.1
250*100	78.49.645.1				500*300		36.43.826.1	36.58.826.1	36.83.819.1
250*150		36.43.352.1	36.58.352.1	36.83.352.1	500*350		36.43.837.1	36.58.837.1	36.83.837.1
250*200		36.43.377.1	36.58.377.1	36.83.377.1	500*400		36.43.854.1	36.58.854.1	36.83.854.1
300* 50	78.49.635.1				500*450		36.43.871.1	36.58.871.1	36.83.871.1
300* 80	78.49.641.1				600* 50	78.49.846.1			
300*100	78.49.646.1				600* 80	78.49.860.1			
300*150		36.43.411.1	36.58.411.1	36.83.411.1	600*100	78.49.871.1			
300*200		36.43.439.1	36.58.439.1	36.83.439.1	600*150	78.49.881.1			
300*250		36.43.473.1	36.58.473.1	36.83.473.1	600*200	78.49.890.1			
350* 50	78.49.841.1				600*250	78.49.898.1			
350* 80	78.49.855.1				600*300				36.83.913.1
350*100	78.49.866.1				600*350				36.83.925.1
350*150		36.43.517.1	36.58.517.1	36.83.517.1	600*400		36.43.945.1	36.58.945.1	36.83.945.1
350*200		36.43.546.1	36.58.546.1	36.83.545.1	600*450		36.43.965.1	36.58.965.1	36.83.965.1
350*250		36.43.580.1	36.58.580.1	36.83.578.1	600*500		36.43.985.1	36.58.985.1	36.83.985.1
350*300		36.43.612.1	36.58.612.1	36.83.599.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE	-----	
15	40-150	281.1	241.1
	200-600	282.1	242.1
20	40- 80	283.1	243.1
	100-600	284.1	244.1
25	40- 40	285.1	305.1
	50- 50	286.1	306.1
	80-100	287.1	307.1
	150-600	288.1	308.1
40	50- 50	290.1	309.1
	80- 80	291.1	310.1
	100-100	292.1	311.1
	150-300	293.1	312.1
	350-600	294.1	313.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450 76.81.73.022.1	450 76.81.73.522.1
840 76.81.73.024.1	840 76.81.73.524.1
1230 76.81.73.026.1	1230 76.81.73.526.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356 76.80.62.442.1	230 76.83.36.251.1
813 76.80.62.444.1	255 76.83.36.252.1
1219 76.80.62.446.1	305 76.83.36.253.1
1524 76.80.62.448.1	355 76.83.36.255.1
1829 76.80.62.450.1	405 76.83.36.256.1
2134 76.80.62.452.1	455 76.83.36.257.1
2438 76.80.62.454.1	
2743 76.80.62.456.1	
3048 76.80.62.458.1	

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

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```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.843.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.843.1
WELDING NECK FLANGE       1      76.66.29.452.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.843.1

```

```

* 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  76.65.61.016.1
GASKET, SPIRAL WOUND                1  85.43.58.112.1
STUD BOLT WITH NUTS                  4  81.38.61.334.1
THERMOWELL STRAIGHT L=230 MM         1  76.83.36.251.1

```

```

* 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   76.65.61.016.1
GASKET, SPIRAL WOUND                  1   85.43.58.112.1
STUD BOLT WITH NUTS                   4   81.38.61.334.1
THERMOWELL STRAIGHT      L=255 MM     1   76.83.36.252.1

```

```

* VENT POINT                DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.082.1
GASKET, SPIRAL WOUND        2  85.43.58.104.1
MONOFL SINGLE BLOCK NEEDLE  1  77.33.46.033.1
WELDING NECK FLANGE         1  76.66.29.452.1

```

* VENT POINT		DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.66.01.084.1		
GASKET, SPIRAL WOUND	2	85.43.58.106.1		
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.034.1		
WELDING NECK FLANGE	1	76.66.29.454.1		

	DN 20	FIG.DE	DN 50	-600
* VENT POINT				
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.66.01.084.1		
GASKET, SPIRAL WOUND	2	85.43.58.106.1		
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.034.1		

BOLTSET WAFER CHECK VALVE

81.38						
DN	NR	INCH	*	MM		

50	8	5/8	*	170	61.284.1	
80	8	3/4	*	210	61.346.1	
100	8	7/8	*	230	61.418.1	
150	12	1	*	330	61.500.1	
200	12	1	1/8	*	370	61.563.1
250	16	1	1/4	*	440	61.630.1
300	20	1	1/4	*	460	61.628.1
350	20	1	3/8	*	520	83.213.1
400	20	1	1/2	*	570	83.288.1
450	20	1	5/8	*	650	83.366.1
500	24	1	5/8	*	670	83.368.1
600	24	1	7/8	*	780	83.519.1

CLASS 63832

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 75 100 120

PRESSURE BAR GA

DN15 -600 99.1 99.1 98.1 95.1

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	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	40S
100	C	C	C	C	B	B	B	A									250	40S
80	C	C	C	B	B	B	A										300	40S
50	C	B	B	B	B	A											350	40
40	B	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
E BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, SOUR	PLANT :	
CLASS NO. : 63832	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPD PIPE (WELDED)	DN250-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-200	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-600	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

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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 (WELDED)	74.36.57										169.1	185.1	203.1	218.1	236.1	251.1	266.1
PIPE	74.36.58	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1							
* FLANGES																	
BLIND FLANGE	76.66.01	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	103.1	104.1	106.1	108.1	110.1
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	332.1	334.1	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
WELDING NECK FLANGE	76.66.29	452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1	470.1	472.1	476.1	478.1	480.1	482.1	484.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					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 FLANGED	77.13.41	103.1	104.1	105.1	107.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.23.41	103.1	104.1	105.1	107.1												
GLOBE VALVE FLANGED	77.33.41	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
MONOFL SINGLE BLOCK BALL	77.03.92	443.1	444.1	445.1	447.1	448.1											
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.43.58	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	642.1	644.1	646.1	648.1												
ORIFICE FLANGE SET	76.66.90					542.1	544.1	594.1	596.1	598.1	600.1	602.1	834.1	835.1	836.1	837.1	838.1

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.843.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.843.1
WELDING NECK FLANGE       1  76.66.29.452.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.843.1

```

```

* 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  76.65.61.016.1
GASKET, SPIRAL WOUND                 1  85.43.58.112.1
STUD BOLT WITH NUTS                  4  81.38.66.334.1
THERMOWELL STRAIGHT L=230 MM         1  76.83.36.251.1

```

```

* 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   76.65.61.016.1
GASKET, SPIRAL WOUND                 1   85.43.58.112.1
STUD BOLT WITH NUTS                  4   81.38.66.334.1
THERMOWELL STRAIGHT      L=255 MM    1   76.83.36.252.1

```

```

* VENT POINT                DN 15  FIG.DF  DN 15 - 25
Branch:N (N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.082.1
GASKET, SPIRAL WOUND        2  85.43.58.104.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.033.1
WELDING NECK FLANGE        1  76.66.29.452.1

```

```

* VENT POINT                DN 20  FIG.DF  DN 40 - 40
Branch:N (N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.084.1
GASKET, SPIRAL WOUND        2  85.43.58.106.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.034.1
WELDING NECK FLANGE        1  76.66.29.454.1

```

```

* VENT POINT                      DN 20  FIG.DE  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                      1  76.66.01.084.1
GASKET, SPIRAL WOUND              2  85.43.58.106.1
MONOFL SINGLE BLOCK NEEDLE       1  77.33.46.034.1

```

BOLTSET WAFER CHECK VALVE

					81.38	
DN	NR	INCH	*	MM		
50	8	5/8	*	170	66.284.1	
80	8	3/4	*	210	66.346.1	
100	8	7/8	*	230	66.418.1	
150	12	1	*	330	66.500.1	
200	12	1	1/8	*	370	66.563.1
250	16	1	1/4	*	440	66.630.1
300	20	1	1/4	*	460	66.637.1
350	20	1	3/8	*	520	86.213.1
400	20	1	1/2	*	570	86.288.1
450	20	1	5/8	*	650	86.366.1
500	24	1	5/8	*	670	86.368.1
600	24	1	7/8	*	780	86.519.1

CLASS 63833

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-50	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -600	103.4	103.4	102.5	100.6	98.3	95.6

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST

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	B	B	B	B	B	A	15	40S
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	A		20	40S
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	40S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	40S
350	C	C	C	C	E	E	E	E	B	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	E	B	B	A							150	40S
150	C	C	C	C	E	B	B	B	A								200	40S
100	C	C	C	C	B	B	B	A									250	40S
80	C	C	C	B	B	B	A										300	40S
50	C	B	B	B	A												350	40
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, LOW TEMP	PLANT :	
CLASS NO. : 63833	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN250-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-200	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-600	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

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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 (WELDED)	74.36.57										169.1	185.1	203.1	218.1	236.1	251.1	266.1
PIPE	74.36.58	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1							
* FLANGES																	
BLIND FLANGE	76.66.01	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	103.1	104.1	106.1	108.1	110.1
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	332.1	334.1	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
WELDING NECK FLANGE	76.66.29	452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1	470.1	472.1	476.1	478.1	480.1	482.1	484.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					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 FLANGED	77.13.41	103.1	104.1	105.1	107.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.23.41	103.1	104.1	105.1	107.1												
GLOBE VALVE FLANGED	77.33.41	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
MONOFL SINGLE BLOCK BALL	77.03.92	443.1	444.1	445.1	447.1	448.1											
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.43.58	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	642.1	644.1	646.1	648.1												
ORIFICE FLANGE SET	76.66.90					542.1	544.1	594.1	596.1	598.1	600.1	602.1	834.1	835.1	836.1	837.1	838.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.49.842.1			
25* 15		36.43.021.1	36.58.021.1	36.83.021.1	400* 80	78.49.856.1			
25* 20		36.43.037.1	36.58.037.1	36.83.037.1	400*100	78.49.867.1			
40* 15		36.43.053.1	36.58.053.1	36.83.053.1	400*150	78.49.877.1			
40* 20		36.43.071.1	36.58.071.1	36.83.071.1	400*200		36.43.640.1	36.58.640.1	36.83.640.1
40* 25		36.43.087.1	36.58.087.1	36.83.087.1	400*250		36.43.660.1	36.58.660.1	36.83.659.1
50* 20		36.43.103.1	36.58.103.1	36.83.103.1	400*300		36.43.676.1	36.58.676.1	36.83.668.1
50* 25		36.43.121.1	36.58.121.1	36.83.121.1	400*350		36.43.686.1	36.58.686.1	36.83.686.1
50* 40		36.43.137.1	36.58.137.1	36.83.137.1	450* 50	78.49.843.1			
80* 40		36.43.153.1	36.58.153.1	36.83.153.1	450* 80	78.49.857.1			
80* 50		36.43.171.1	36.58.171.1	36.83.171.1	450*100	78.49.868.1			
100* 40		36.43.187.1	36.58.187.1	36.83.187.1	450*150	78.49.878.1			
100* 50		36.43.206.1	36.58.206.1	36.83.206.1	450*200				36.83.709.1
100* 80		36.43.225.1	36.58.225.1	36.83.225.1	450*250		36.43.726.1	36.58.726.1	36.83.725.1
150* 50	78.49.632.1				450*300		36.43.743.1	36.58.743.1	36.83.734.1
150* 80		36.43.244.1	36.58.244.1	36.83.244.1	450*350		36.43.752.1	36.58.752.1	36.83.752.1
150*100		36.43.261.1	36.58.261.1	36.83.261.1	450*400		36.43.769.1	36.58.769.1	36.83.769.1
200* 50	78.49.633.1				500* 50	78.49.844.1			
200* 80	78.49.639.1				500* 80	78.49.858.1			
200*100		36.43.281.1	36.58.281.1	36.83.281.1	500*100	78.49.869.1			
200*150		36.43.305.1	36.58.305.1	36.83.305.1	500*150	78.49.879.1			
250* 50	78.49.634.1				500*200	78.49.888.1			
250* 80	78.49.640.1				500*250				36.83.811.1
250*100	78.49.645.1				500*300		36.43.826.1	36.58.826.1	36.83.819.1
250*150		36.43.352.1	36.58.352.1	36.83.352.1	500*350		36.43.837.1	36.58.837.1	36.83.837.1
250*200		36.43.377.1	36.58.377.1	36.83.377.1	500*400		36.43.854.1	36.58.854.1	36.83.854.1
300* 50	78.49.635.1				500*450		36.43.871.1	36.58.871.1	36.83.871.1
300* 80	78.49.641.1				600* 50	78.49.846.1			
300*100	78.49.646.1				600* 80	78.49.860.1			
300*150		36.43.411.1	36.58.411.1	36.83.411.1	600*100	78.49.871.1			
300*200		36.43.439.1	36.58.439.1	36.83.439.1	600*150	78.49.881.1			
300*250		36.43.473.1	36.58.473.1	36.83.473.1	600*200	78.49.890.1			
350* 50	78.49.841.1				600*250	78.49.898.1			
350* 80	78.49.855.1				600*300				36.83.913.1
350*100	78.49.866.1				600*350				36.83.925.1
350*150		36.43.517.1	36.58.517.1	36.83.517.1	600*400		36.43.945.1	36.58.945.1	36.83.945.1
350*200		36.43.546.1	36.58.546.1	36.83.545.1	600*450		36.43.965.1	36.58.965.1	36.83.965.1
350*250		36.43.580.1	36.58.580.1	36.83.578.1	600*500		36.43.985.1	36.58.985.1	36.83.985.1
350*300		36.43.612.1	36.58.612.1	36.83.599.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE	-----	
15	40-150	281.1	241.1
	200-600	282.1	242.1
20	40- 80	283.1	243.1
	100-600	284.1	244.1
25	40- 40	285.1	305.1
	50- 50	286.1	306.1
	80-100	287.1	307.1
	150-600	288.1	308.1
40	50- 50	290.1	309.1
	80- 80	291.1	310.1
	100-100	292.1	311.1
	150-300	293.1	312.1
	350-600	294.1	313.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450 76.81.73.022.1	450 76.81.73.522.1
840 76.81.73.024.1	840 76.81.73.524.1
1230 76.81.73.026.1	1230 76.81.73.526.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356 76.80.62.442.1	230 76.83.36.251.1
813 76.80.62.444.1	255 76.83.36.252.1
1219 76.80.62.446.1	305 76.83.36.253.1
1524 76.80.62.448.1	355 76.83.36.255.1
1829 76.80.62.450.1	405 76.83.36.256.1
2134 76.80.62.452.1	455 76.83.36.257.1
2438 76.80.62.454.1	
2743 76.80.62.456.1	
3048 76.80.62.458.1	

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

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ISSUE DATE : DECEMBER 1998

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.843.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.843.1
WELDING NECK FLANGE       1  76.66.29.452.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.104.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.843.1

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* 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  76.65.61.016.1
GASKET, SPIRAL WOUND                1  85.43.58.112.1
STUD BOLT WITH NUTS                  4  81.38.63.334.1
THERMOWELL STRAIGHT L=230 MM        1  76.83.36.251.1

```

```

* 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   76.65.61.016.1
GASKET, SPIRAL WOUND                 1   85.43.58.112.1
STUD BOLT WITH NUTS                  4   81.38.63.334.1
THERMOWELL STRAIGHT      L=255 MM    1   76.83.36.252.1

```

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* VENT POINT                      DN 15  FIG.DF  DN 15 - 25
Branch:N (N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
BLIND FLANGE                      1  76.66.01.082.1
GASKET, SPIRAL WOUND              2  85.43.58.104.1
MONOFL SINGLE BLOCK NEEDLE        1  77.33.46.033.1
WELDING NECK FLANGE              1  76.66.29.452.1

```

* VENT POINT		DN 20	FIG.DF	DN 40 - 40
Branch:N	(:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE		1	76.66.01.084.1	
GASKET, SPIRAL WOUND		2	85.43.58.106.1	
MONOFL SINGLE BLOCK NEEDLE		1	77.33.46.034.1	
WELDING NECK FLANGE		1	76.66.29.454.1	

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* VENT POINT                      DN 20 FIG.DE   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                      1  76.66.01.084.1
GASKET, SPIRAL WOUND              2  85.43.58.106.1
MONOFL SINGLE BLOCK NEEDLE       1  77.33.46.034.1

```

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	
50	8	5/8	*	170	63.284.1
80	8	3/4	*	210	63.346.1
100	8	7/8	*	230	63.418.1
150	12	1	*	330	63.500.1
200	12	1	1/8	*	370 63.563.1
250	16	1	1/4	*	440 63.628.1
300	20	1	1/4	*	460 63.637.1
350	20	1	3/8	*	520 63.667.1
400	20	1	1/2	*	570 63.714.1
450	20	1	5/8	*	650 63.749.1
500	24	1	5/8	*	670 63.368.1
600	24	1	7/8	*	780 63.812.1

CLASS 63834

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 75 100 120

PRESSURE BAR GA

DN15 -600 99.1 99.1 98.1 95.1

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	40S
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	40S
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	40S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	40S
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40S
300	C	C	C	C	E	E	E	B	B	B	A						80	40S
250	C	C	C	C	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	40S
100	C	C	C	B	B	B	A										250	40S
80	C	C	C	B	B	A											300	40S
50	C	B	B	B	A												350	40
40	B	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
E	BRANCH OUTLET

FOR BASIS OF DESIGN SEE DEP 31.38.01.10-Gen.

DUPLEX, UNS S31803, LT SOUR	PLANT :	
CLASS NO. : 63834	CONSIGNEE :	
ANS RATING : CLASS 600	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPD PIPE (WELDED)	DN250-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-200	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-600	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
LEGR LEVEL GAUGE REFLEX	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
LEGT LEVEL GAUGE THROUGH VISION	DN 20- 20	BODY: DUPLEX UNS S31803 BOLT: ASTM A320-L7M/A194-7M
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57										169.1	185.1	203.1	218.1	236.1	251.1	266.1
PIPE	74.36.58	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1							
* FLANGES																	
BLIND FLANGE	76.66.01	082.1	084.1	086.1	088.1	090.1	092.1	094.1	096.1	098.1	100.1	102.1	103.1	104.1	106.1	108.1	110.1
SPECTACLE BLIND FLANGE	76.88.24	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
SPADE BLIND	76.88.41	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)	76.88.23	332.1	334.1	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
WELDING NECK FLANGE	76.66.29	452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1	470.1	472.1	476.1	478.1	480.1	482.1	484.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	156.1	169.1	185.1	203.1	218.1	236.1	251.1	266.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					608.1	610.1	612.1	614.1	615.1	616.1	617.1	618.1	619.1	620.1	621.1	623.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					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 FLANGED	77.13.41	103.1	104.1	105.1	107.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					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	77.23.41	103.1	104.1	105.1	107.1												
GLOBE VALVE FLANGED	77.33.41	103.1	104.1	105.1	107.1	108.1	110.1	112.1	114.1								
MONOFL SINGLE BLOCK BALL	77.03.92	443.1	444.1	445.1	447.1	448.1											
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.43.58	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	642.1	644.1	646.1	648.1												
ORIFICE FLANGE SET	76.66.90					542.1	544.1	594.1	596.1	598.1	600.1	602.1	834.1	835.1	836.1	837.1	838.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.49.842.1			
25* 15		36.43.021.1	36.58.021.1	36.83.021.1	400* 80	78.49.856.1			
25* 20		36.43.037.1	36.58.037.1	36.83.037.1	400*100	78.49.867.1			
40* 15		36.43.053.1	36.58.053.1	36.83.053.1	400*150	78.49.877.1			
40* 20		36.43.071.1	36.58.071.1	36.83.071.1	400*200		36.43.640.1	36.58.640.1	36.83.640.1
40* 25		36.43.087.1	36.58.087.1	36.83.087.1	400*250		36.43.660.1	36.58.660.1	36.83.659.1
50* 20		36.43.103.1	36.58.103.1	36.83.103.1	400*300		36.43.676.1	36.58.676.1	36.83.668.1
50* 25		36.43.121.1	36.58.121.1	36.83.121.1	400*350		36.43.686.1	36.58.686.1	36.83.686.1
50* 40		36.43.137.1	36.58.137.1	36.83.137.1	450* 50	78.49.843.1			
80* 40		36.43.153.1	36.58.153.1	36.83.153.1	450* 80	78.49.857.1			
80* 50		36.43.171.1	36.58.171.1	36.83.171.1	450*100	78.49.868.1			
100* 40		36.43.187.1	36.58.187.1	36.83.187.1	450*150	78.49.878.1			
100* 50		36.43.206.1	36.58.206.1	36.83.206.1	450*200				36.83.709.1
100* 80		36.43.225.1	36.58.225.1	36.83.225.1	450*250		36.43.726.1	36.58.726.1	36.83.725.1
150* 50	78.49.632.1				450*300		36.43.743.1	36.58.743.1	36.83.734.1
150* 80		36.43.244.1	36.58.244.1	36.83.244.1	450*350		36.43.752.1	36.58.752.1	36.83.752.1
150*100		36.43.261.1	36.58.261.1	36.83.261.1	450*400		36.43.769.1	36.58.769.1	36.83.769.1
200* 50	78.49.633.1				500* 50	78.49.844.1			
200* 80	78.49.639.1				500* 80	78.49.858.1			
200*100		36.43.281.1	36.58.281.1	36.83.281.1	500*100	78.49.869.1			
200*150		36.43.305.1	36.58.305.1	36.83.305.1	500*150	78.49.879.1			
250* 50	78.49.634.1				500*200	78.49.888.1			
250* 80	78.49.640.1				500*250				36.83.811.1
250*100	78.49.645.1				500*300		36.43.826.1	36.58.826.1	36.83.819.1
250*150		36.43.352.1	36.58.352.1	36.83.352.1	500*350		36.43.837.1	36.58.837.1	36.83.837.1
250*200		36.43.377.1	36.58.377.1	36.83.377.1	500*400		36.43.854.1	36.58.854.1	36.83.854.1
300* 50	78.49.635.1				500*450		36.43.871.1	36.58.871.1	36.83.871.1
300* 80	78.49.641.1				600* 50	78.49.846.1			
300*100	78.49.646.1				600* 80	78.49.860.1			
300*150		36.43.411.1	36.58.411.1	36.83.411.1	600*100	78.49.871.1			
300*200		36.43.439.1	36.58.439.1	36.83.439.1	600*150	78.49.881.1			
300*250		36.43.473.1	36.58.473.1	36.83.473.1	600*200	78.49.890.1			
350* 50	78.49.841.1				600*250	78.49.898.1			
350* 80	78.49.855.1				600*300				36.83.913.1
350*100	78.49.866.1				600*350				36.83.925.1
350*150		36.43.517.1	36.58.517.1	36.83.517.1	600*400		36.43.945.1	36.58.945.1	36.83.945.1
350*200		36.43.546.1	36.58.546.1	36.83.545.1	600*450		36.43.965.1	36.58.965.1	36.83.965.1
350*250		36.43.580.1	36.58.580.1	36.83.578.1	600*500		36.43.985.1	36.58.985.1	36.83.985.1
350*300		36.43.612.1	36.58.612.1	36.83.599.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE	-----	
15	40-150	281.1	241.1
	200-600	282.1	242.1
20	40- 80	283.1	243.1
	100-600	284.1	244.1
25	40- 40	285.1	305.1
	50- 50	286.1	306.1
	80-100	287.1	307.1
	150-600	288.1	308.1
40	50- 50	290.1	309.1
	80- 80	291.1	310.1
	100-100	292.1	311.1
	150-300	293.1	312.1
	350-600	294.1	313.1

LEVEL GAUGE THROUGH-VISION	LEVEL GAUGE REFLEX
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
450 76.81.73.022.1	450 76.81.73.522.1
840 76.81.73.024.1	840 76.81.73.524.1
1230 76.81.73.026.1	1230 76.81.73.526.1

LEVEL DISPLACER CHAMBER	THERMOWELL
LENGTH MESCNUMBER	LENGTH MESCNUMBER
-----	-----
356 76.80.62.442.1	230 76.83.36.251.1
813 76.80.62.444.1	255 76.83.36.252.1
1219 76.80.62.446.1	305 76.83.36.253.1
1524 76.80.62.448.1	355 76.83.36.255.1
1829 76.80.62.450.1	405 76.83.36.256.1
2134 76.80.62.452.1	455 76.83.36.257.1
2438 76.80.62.454.1	
2743 76.80.62.456.1	
3048 76.80.62.458.1	

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

BOLTSET WAFER CHECK VALVE

81.38				
DN	NR	INCH	*	MM
50	8	5/8	*	170
80	8	3/4	*	210
100	8	7/8	*	230
150	12	1	*	330
200	12	1 1/8	*	370
250	16	1 1/4	*	440
300	20	1 1/4	*	460
350	20	1 3/8	*	520
400	20	1 1/2	*	570
450	20	1 5/8	*	650
500	24	1 5/8	*	670
600	24	1 7/8	*	780

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.082.1	
GASKET, SPIRAL WOUND	2	85.43.58.104.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.443.1	
WELDING NECK FLANGE	1	76.66.29.452.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.084.1	
GASKET, SPIRAL WOUND	2	85.43.58.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.444.1	
WELDING NECK FLANGE	1	76.66.29.454.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.084.1	
GASKET, SPIRAL WOUND	2	85.43.58.106.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.444.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.43.58.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.843.1	
WELDING NECK FLANGE	2	76.66.29.452.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.843.1	
WELDING NECK FLANGE	1	76.66.29.452.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.843.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.43.58.104.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.843.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.843.1	
WELDING NECK FLANGE	1	76.66.29.452.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.104.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.843.1	
* 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	76.65.61.016.1	
GASKET, SPIRAL WOUND	1	85.43.58.112.1	
STUD BOLT WITH NUTS	4	81.38.67.334.1	
THERMOWELL STRAIGHT L=230 MM	1	76.83.36.251.1	
* 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	76.65.61.016.1	
GASKET, SPIRAL WOUND	1	85.43.58.112.1	
STUD BOLT WITH NUTS	4	81.38.67.334.1	
THERMOWELL STRAIGHT L=255 MM	1	76.83.36.252.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.082.1	
GASKET, SPIRAL WOUND	2	85.43.58.104.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.033.1	
WELDING NECK FLANGE	1	76.66.29.452.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.084.1	
GASKET, SPIRAL WOUND	2	85.43.58.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.034.1	
WELDING NECK FLANGE	1	76.66.29.454.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.084.1	
GASKET, SPIRAL WOUND	2	85.43.58.106.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.034.1	

PIPING CLASSES ASME RATING 900

CLASS 91410

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 153.0 150.1 144.0 139.1 137.8

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.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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 80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20 80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25 80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40 80
350	C	C	C	C	E	E	E	B	B	B	B	A					50 80
300	C	C	C	C	E	E	E	B	B	B	A						80 80
250	C	C	C	C	E	E	E	B	B	A							100 80
200	C	C	C	C	E	E	B	B	A								150 120
150	C	C	C	C	E	B	B	A									200 100
100	C	C	C	B	B	B	A										250 100
80	C	C	C	B	B	A											300 100
50	C	B	B	B	A												350 100
40	B	B	B	A													400 100
25	B	B	A														450 100
20	B	A															500 100
15	A																600 100

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	PLANT	:	
CLASS NO. : 91410	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91410, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-350	ASTM A106-B
		DN400-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* 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 80-350	ASTM A105
		DN400-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	223.1	259.1	299.1	345.1	393.1					
	74.30.17														145.1	180.1	216.1	248.1
* 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	338.1	340.1	342.1	
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	148.1	150.1	152.1	
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	148.1	150.1	152.1	
WELDING NECK FLANGE	76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	866.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1	
* FITTINGS																		
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	120.1	140.1	161.1	184.1	204.1					
	76.31.18														374.1	390.1	400.1	411.1
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	690.1	711.1	734.1	754.1					
	76.31.38														374.1	390.1	400.1	411.1
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	690.1	711.1	734.1	754.1					
	76.31.39														374.1	391.1	401.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	690.1	711.1	734.1	754.1					
	76.31.84														374.1	392.1	402.1	412.1
* VALVES																		
BALL VALVE FULL BORE TRUN FLGD	77.00.72					658.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	670.1	671.1	673.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.72					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1													
	77.10.23					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1													
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1													
	77.30.23					208.1	160.1	162.1	164.1									
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1												
* 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	486.1	488.1	492.1	
METER RUN	76.64.96	082.1	084.1	086.1	088.1													
ORIFICE FLANGE SET	76.62.95					910.1	832.1	834.1	866.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1	

	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	79.05.547.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.05.560.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.05.572.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150		29.44.766.1	29.59.757.1	31.85.473.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200		31.70.456.1	30.73.456.1	31.85.482.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250		31.70.465.1	30.73.465.1	31.85.508.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300		31.70.477.1	31.71.477.1	31.85.534.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350		31.70.488.1	31.71.488.1	31.85.559.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1	450* 80	79.05.561.1			
80* 40		30.72.227.1	30.73.227.1	30.89.124.1	450*100	79.05.573.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*200		31.70.506.1	31.71.506.1	31.85.583.1
100* 40		30.72.251.1	30.73.251.1	30.89.142.1	450*250		31.70.527.1	31.71.527.1	31.85.607.1
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*300		31.70.557.1	31.71.557.1	31.85.631.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*350		31.70.588.1	31.71.588.1	31.85.655.1
150* 50	79.02.358.1				450*400		31.70.618.1	31.71.618.1	31.85.679.1
150* 80	79.02.382.1	30.72.299.1	30.73.299.1	30.89.184.1	500* 80	79.05.562.1			
150*100	79.02.404.1	30.72.310.1	30.73.301.1	30.89.198.1	500*100	79.05.574.1			
200* 50	79.01.543.1				500*200		29.44.905.1	29.59.905.1	31.85.703.1
200* 80	79.01.556.1				500*250		31.70.637.1	29.59.935.1	31.85.727.1
200*100		30.72.330.1	30.73.330.1	30.89.216.1	500*300		31.70.647.1	31.71.647.1	31.85.751.1
200*150		30.72.338.1	30.73.338.1	30.89.237.1	500*350		31.70.678.1	31.71.678.1	31.85.775.1
250* 50	79.01.544.1				500*400		31.70.708.1	31.71.708.1	31.85.799.1
250* 80	79.01.557.1				500*450		31.70.738.1	31.71.738.1	31.85.823.1
250*100		29.46.350.1	29.61.350.1	30.89.263.1	600* 80	79.05.564.1			
250*150		30.72.351.1	30.73.351.1	30.89.281.1	600*100	79.05.576.1			
250*200		30.72.367.1	30.73.367.1	30.89.294.1	600*200	79.05.699.1			
300* 50	79.01.545.1				600*250	79.05.705.1	31.70.806.1	31.71.806.1	31.85.847.1
300* 80	79.01.558.1				600*300		31.70.826.1	31.71.826.1	31.85.871.1
300*100	79.01.570.1				600*350		31.70.846.1	31.71.846.1	31.85.895.1
300*150		30.72.379.1	30.73.379.1	30.89.321.1	600*400		31.70.888.1	31.71.888.1	31.85.919.1
300*200		30.72.397.1	30.73.397.1	30.89.331.1	600*450		31.70.918.1	31.71.918.1	31.85.943.1
300*250		30.72.407.1	30.73.407.1	30.89.353.1	600*500		31.70.948.1	31.71.948.1	31.85.967.1
350* 50	79.01.546.1								
350* 80	79.01.559.1								
350*100	79.01.571.1								
350*150		29.46.608.1	29.61.608.1	30.89.383.1					
350*200		30.72.425.1	30.73.425.1	30.89.393.1					
350*250		30.72.437.1	30.73.437.1	30.89.418.1					
350*300		30.72.448.1	30.73.448.1	30.89.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	301.1	001.1
	200-600	302.1	002.1
20	40- 80	303.1	003.1
	100-600	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-600	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
	350-600	314.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.102.1			230 76.83.37.121.1
813	76.80.60.104.1			255 76.83.37.122.1
1219	76.80.60.106.1			305 76.83.37.123.1
1524	76.80.60.108.1			355 76.83.37.125.1
1829	76.80.60.110.1			405 76.83.37.126.1
2134	76.80.60.112.1			455 76.83.37.127.1
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
20	4	3/4	*	110	61.330.1	20	4	3/4	*	120
25	4	7/8	*	130	61.403.1	25	4	7/8	*	130
40	4	1	*	140	61.469.1	40	4	1	*	140
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				
450	20	1	7/8	*	330	61.786.1				
500	20	2		*	410	61.825.1				
600	20	2	1/2	*	520	83.703.1				

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	1/8	*	180	61.533.1		100	8	1/8	*	200	61.525.1
150	12	1/8	*	210	61.538.1		150	12	1/8	*	230	61.541.1
200	12	3/8	*	240	61.646.1		200	12	3/8	*	270	61.641.1
250	16	3/8	*	250	61.647.1		250	16	3/8	*	290	61.654.1
300	20	3/8	*	280	61.652.1		300	20	3/8	*	310	61.656.1
350	20	1/2	*	300	61.696.1		350	20	1/2	*	350	61.704.1
400	20	5/8	*	310	61.727.1		400	20	5/8	*	360	61.736.1
450	20	7/8	*	350	61.789.1		450	20	7/8	*	420	61.802.1
500	20	2	*	440	61.829.1		500	20	2	*	500	83.561.1
600	20	2 1/2	*	540	83.705.1		600	20	2 1/2	*	620	83.713.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	61.417.1
80	8	7/8	* 230	61.418.1
100	8	1/8	* 280	61.549.1
150	12	1/8	* 360	61.562.1
200	12	3/8	* 440	61.669.1
250	16	3/8	* 490	61.674.1
300	20	3/8	* 560	83.217.1
350	20	1/2	* 640	83.295.1
400	20	5/8	* 690	83.370.1
450	20	7/8	* 780	83.519.1
500	20	2	* 860	83.595.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.79.902.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.464.1
WELDING NECK FLANGE   1  76.62.79.904.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-600
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.79.902.1

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```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE       1    76.62.79.902.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE        1  76.62.79.902.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

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* 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  76.83.37.121.1

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* 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   76.62.60.537.1
GASKET, SPIRAL WOUND                1   85.41.46.512.1
STUD BOLT WITH NUTS                  4   81.38.61.472.1
THERMOWELL STRAIGHT                  1   76.83.37.122.1
                                L=255 MM

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE         1  76.62.79.902.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE         1  76.62.79.904.1

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* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	

CLASS 91420

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 75 100 120

PRESSURE BAR GA

DN15 -600 137.5 137.5 137.3 136.7

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	E	B	B	B	A					50	80
300	C	C	C	C	E	E	E	E	B	B	B	A					80	80
250	C	C	C	C	E	E	E	E	B	B	A						100	80
200	C	C	C	C	E	E	E	B	B	A							150	80
150	C	C	C	C	E	B	B	A									200	100
100	C	C	C	B	B	B	A										250	100
80	C	C	C	B	B	A											300	100
50	C	B	B	B	A												350	100
40	B	B	B	A													400	100
25	B	B	A														450	100
20	B	A															500	100
15	A																600	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 SOUR	PLANT :	
CLASS NO. : 91420	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91420, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-350	ASTM A106-B
		DN400-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* 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 80-350	ASTM A105
		DN400-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

91420, 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	74.30.03	018.1	028.1	038.1	058.1	071.1	109.1	157.1	219.1	259.1	299.1	345.1	393.1					
	74.30.16														145.1	178.1	218.1	248.1
* 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	338.1	340.1	342.1	
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	148.1	150.1	152.1	
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	148.1	150.1	152.1	
WELDING NECK FLANGE	76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	836.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1	
* FITTINGS																		
CAP BUTT-WELD.END	76.30.17	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	690.1	711.1	734.1	754.1					
	76.31.17														374.1	390.1	400.1	411.1
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	690.1	711.1	734.1	754.1					
	76.31.34														374.1	389.1	399.1	409.1
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	690.1	711.1	734.1	754.1					
	76.31.43														374.1	389.1	399.1	409.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	690.1	711.1	734.1	754.1					
	76.31.80														374.1	389.1	399.1	409.1
* VALVES																		
BALL VALVE FULL BORE TRUN FLGD	77.00.72					658.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	670.1	671.1	673.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.72					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1													
	77.10.23					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1													
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1													
	77.30.23					208.1	160.1	162.1	164.1									
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1												
* 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	486.1	488.1	492.1	
METER RUN	76.64.96	082.1	084.1	086.1	088.1													
ORIFICE FLANGE SET	76.62.95					910.1	832.1	834.1	836.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1	

	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	79.05.547.1			
25* 15		30.66.147.1	30.67.147.1	30.88.045.1	400* 80	79.05.560.1			
25* 20		30.66.157.1	30.67.157.1	30.88.055.1	400*100	79.05.572.1			
40* 15		30.66.167.1	30.67.167.1	30.88.065.1	400*150		29.45.756.1	29.60.756.1	
40* 20		30.66.177.1	30.67.177.1	30.88.075.1	400*200		31.66.456.1	31.75.456.1	31.88.482.1
40* 25		30.66.187.1	30.67.187.1	30.88.085.1	400*250		31.66.465.1	31.75.465.1	31.88.508.1
50* 20		30.66.194.1	30.67.194.1	30.88.097.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		30.66.197.1	30.67.197.1	30.88.106.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		30.66.207.1	30.67.207.1	30.88.115.1	450* 80	79.05.561.1			
80* 40		30.66.227.1	30.67.227.1	30.88.124.1	450*100	79.05.573.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*150	79.05.585.1			
100* 40		30.66.251.1	30.67.251.1	30.88.142.1	450*200		31.66.506.1	31.75.506.1	31.88.583.1
100* 50	79.01.362.1	30.66.267.1	30.67.267.1	30.88.154.1	450*250		31.66.527.1	31.75.527.1	31.88.607.1
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1	450*300		31.66.557.1	31.75.557.1	31.88.631.1
150* 50	79.01.364.1				450*350		31.66.588.1	31.75.588.1	31.88.655.1
150* 80	79.01.388.1	30.66.297.1	30.67.297.1	30.88.178.1	450*400		31.66.618.1	31.75.618.1	31.88.679.1
150*100	79.01.410.1	30.66.307.1	30.67.307.1	30.88.190.1	500* 80	79.05.562.1			
200* 50	79.01.543.1				500*100	79.05.574.1			
200* 80	79.01.556.1				500*150	79.05.586.1			
200*100		30.66.330.1	30.67.330.1	30.88.216.1	500*200	79.05.698.1	29.45.905.1	29.60.905.1	31.88.703.1
200*150		29.47.320.1	29.62.320.1	30.88.236.1	500*250		29.45.938.1	29.60.939.1	31.88.727.1
250* 50	79.01.544.1				500*300		31.66.647.1	31.75.647.1	31.88.751.1
250* 80	79.01.557.1				500*350		31.66.678.1	31.75.678.1	31.88.775.1
250*100		29.47.350.1	29.62.350.1	30.88.263.1	500*400		31.66.708.1	31.75.708.1	31.88.799.1
250*150		30.66.354.1	30.67.354.1	30.88.280.1	500*450		31.66.738.1	31.75.738.1	31.88.823.1
250*200		30.66.367.1	30.67.367.1	30.88.294.1	600* 80	79.05.564.1			
300* 50	79.01.545.1				600*100	79.05.576.1			
300* 80	79.01.558.1				600*150	79.05.588.1			
300*100	79.01.570.1				600*200	79.05.699.1			
300*150		29.47.465.1	29.62.465.1	30.88.320.1	600*250	79.05.705.1	31.66.806.1	31.75.806.1	31.88.847.1
300*200		30.66.397.1	30.67.397.1	30.88.331.1	600*300		31.66.826.1	31.75.826.1	31.88.871.1
300*250		30.66.407.1	30.67.407.1	30.88.353.1	600*350		31.66.846.1	31.75.846.1	31.88.895.1
350* 50	79.01.546.1				600*400		31.66.888.1	31.75.888.1	31.88.919.1
350* 80	79.01.559.1				600*450		31.66.918.1	31.75.918.1	31.88.943.1
350*100	79.01.571.1				600*500		31.66.948.1	31.75.948.1	31.88.967.1
350*150		29.47.606.1	29.62.606.1	30.88.382.1					
350*200		30.66.425.1	30.67.425.1	30.88.393.1					
350*250		30.66.437.1	30.67.437.1	30.88.418.1					
350*300		30.66.448.1	30.67.448.1	30.88.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	301.1	001.1
	200-600	302.1	002.1
20	40- 80	303.1	003.1
	100-600	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-600	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
	350-600	314.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.462.1			230 76.83.37.121.1
813	76.80.60.464.1			255 76.83.37.122.1
1219	76.80.60.466.1			305 76.83.37.123.1
1524	76.80.60.468.1			355 76.83.37.125.1
1829	76.80.60.470.1			405 76.83.37.126.1
2134	76.80.60.472.1			455 76.83.37.127.1
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
20	4	3/4	*	110	66.330.1	20	4	3/4	*	120
25	4	7/8	*	130	66.403.1	25	4	7/8	*	130
40	4	1	*	140	66.469.1	40	4	1	*	140
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				
450	20	1	7/8	*	330	66.786.1				
500	20	2	*	410	66.825.1					
600	20	2	1/2	*	520	86.703.1				

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	1/8	*	180	66.533.1		100	8	1/8	*	200	66.525.1
150	12	1/8	*	210	66.538.1		150	12	1/8	*	230	66.541.1
200	12	3/8	*	240	66.646.1		200	12	3/8	*	270	66.662.1
250	16	3/8	*	250	66.647.1		250	16	3/8	*	290	66.654.1
300	20	3/8	*	280	66.652.1		300	20	3/8	*	310	66.656.1
350	20	1/2	*	300	66.696.1		350	20	1/2	*	350	66.704.1
400	20	5/8	*	310	66.727.1		400	20	5/8	*	360	66.736.1
450	20	1/8	*	350	66.789.1		450	20	1/8	*	420	66.802.1
500	20	2	*	440	66.829.1		500	20	2	*	500	86.561.1
600	20	2 1/2	*	540	86.705.1		600	20	2 1/2	*	620	86.713.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	7/8	* 220	66.417.1
80	8	7/8	* 230	66.418.1
100	8	1/8	* 280	66.549.1
150	12	1/8	* 360	66.562.1
200	12	3/8	* 440	66.673.1
250	16	3/8	* 490	66.674.1
300	20	3/8	* 560	86.217.1
350	20	1/2	* 640	86.295.1
400	20	5/8	* 690	86.370.1
450	20	7/8	* 780	86.519.1
500	20	2	* 860	86.595.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.79.902.1

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```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.464.1
WELDING NECK FLANGE   1  76.62.79.904.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-600
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.79.902.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE       1    76.62.79.902.1
```

```
* PI ON PIPING CL COUP    DN 15    FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1    77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1  76.62.79.902.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

```

* 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                   1  76.83.37.121.1
                                L=230 MM

```

```

* 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   76.62.60.537.1
GASKET, SPIRAL WOUND                 1   85.41.46.512.1
STUD BOLT WITH NUTS                   4   81.38.66.472.1
THERMOWELL STRAIGHT                   1   76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.043.1
WELDING NECK FLANGE         1  76.62.79.902.1

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```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1
WELDING NECK FLANGE         1  76.62.79.904.1

```

* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	

CLASS 91430

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 153.0 150.1 144.0 139.1 137.8

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.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	160
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	160
300	C	C	C	C	E	E	E	B	B	B	A						80	160
250	C	C	C	C	E	E	E	B	B	A							100	120
200	C	C	C	C	E	E	B	B	A								150	120
150	C	C	C	C	E	B	B	A									200	120
100	C	C	C	B	B	B	A										250	120
80	C	C	C	B	B	A											300	120
50	C	B	B	B	A												350	120
40	B	B	B	A													400	120
25	B	B	A														450	120
20	B	A															500	120
15	A																600	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. : 91430	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91430, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-250	ASTM A106-B
		DN300-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-250	ASTM A234-WPB
		DN300-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-250	ASTM A234-WPB
		DN300-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-250	ASTM A234-WPB
		DN300-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-250	ASTM A234-WPB
		DN300-600	ASTM A420-WPL6

* 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 80-250	ASTM A105
		DN300-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-250	ASTM A234-WPB
		DN300-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-250	ASTM A234-WPB
		DN300-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-250	ASTM A234-WPB
		DN300-600	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

91430, 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	113.1	159.1	223.1	263.1	303.1						
	74.30.17											124.1	137.1	146.1	182.1	218.1	250.1
* 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	338.1	340.1	342.1
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	148.1	150.1	152.1
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	148.1	150.1	152.1
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	878.1	880.1	884.1
* 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						
	76.31.18											335.1	355.1	375.1	391.1	401.1	412.1
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						
	76.31.38											335.1	355.1	375.1	391.1	401.1	412.1
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						
	76.31.39											335.1	355.1	375.1	392.1	402.1	413.1
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						
	76.31.84											335.1	355.1	375.1	393.1	403.1	413.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.73					658.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	670.1	671.1	673.1
BALL VALVE RED. BORE TRUN FLGD	77.00.73					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1												
	77.10.23					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1												
	77.30.23					208.1	160.1	162.1	164.1								
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1											
* 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	486.1	488.1	492.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					970.1	886.1	864.1	866.1	868.1	870.1	872.1	874.1	876.1	878.1	880.1	884.1

	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	79.07.007.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.07.020.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.06.680.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.06.700.1	29.44.742.1	29.59.742.1	31.85.465.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200	79.06.718.1	31.70.457.1	31.71.457.1	31.85.483.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250	79.06.734.1	31.70.466.1	31.71.466.1	31.85.509.1
50* 20		29.46.195.1	29.61.195.1	30.89.098.1	400*300	79.06.748.1	31.70.476.1	31.71.476.1	31.85.535.1
50* 25		30.72.201.1	30.73.201.1	30.89.107.1	400*350	79.06.760.1	31.70.490.1	31.71.490.1	31.85.560.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1	450* 50	79.07.008.1			
80* 40		30.72.231.1	30.73.231.1	30.89.125.1	450*100	79.06.682.1			
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1	450*150	79.06.702.1			
100* 40		30.72.255.1	30.73.255.1	30.89.161.1	450*200	79.06.720.1	31.70.507.1	31.71.507.1	31.85.584.1
100* 50	79.03.001.1	30.72.270.1	30.73.270.1	30.89.161.1	450*250	79.06.736.1	31.70.528.1	31.71.528.1	31.85.608.1
100* 80	79.03.014.1	30.72.280.1	30.73.280.1	30.89.173.1	450*300	79.06.750.1	31.70.558.1	31.71.558.1	31.85.632.1
150* 50	79.03.002.1				450*350	79.06.762.1	31.70.589.1	31.71.589.1	31.85.656.1
150* 80	79.03.015.1	30.72.300.1	30.73.300.1	30.89.185.1	450*400		31.70.619.1	31.71.619.1	31.85.680.1
150*100	79.02.670.1	30.72.309.1	30.73.309.1	30.89.191.1	500* 50	79.07.009.1			
200* 50	79.03.003.1				500*100	79.06.684.1			
200* 80	79.03.016.1				500*150	79.06.704.1			
200*100	79.02.672.1	30.72.329.1	30.73.329.1	30.89.207.1	500*200	79.06.722.1	29.44.906.1	29.59.906.1	31.85.704.1
200*150	79.02.692.1	30.72.339.1	30.73.339.1	30.89.227.1	500*250	79.06.738.1	31.70.638.1	29.59.936.1	31.85.728.1
250* 50	79.03.004.1				500*300	79.06.752.1	31.70.648.1	31.71.648.1	31.85.752.1
250* 80	79.03.017.1				500*350	79.06.764.1	31.70.679.1	31.71.679.1	31.85.776.1
250*100	79.02.674.1	30.72.347.1	30.73.347.1	30.89.255.1	500*400		31.70.709.1	31.71.709.1	31.85.800.1
250*150	79.02.694.1	30.72.359.1	30.73.359.1	30.89.273.1	500*450		31.70.739.1	31.71.739.1	31.85.824.1
250*200	79.02.712.1	30.72.369.1	30.73.369.1	30.89.295.1	600* 50	79.07.011.1			
300* 50	79.07.005.1				600*100	79.06.688.1			
300* 80	79.07.018.1				600*150	79.06.708.1			
300*100	79.06.676.1				600*200	79.06.726.1			
300*150	79.06.696.1	31.70.387.1	31.71.387.1	31.85.312.1	600*250	79.06.742.1	31.70.807.1	31.71.807.1	31.85.848.1
300*200	79.06.714.1	31.70.399.1	31.71.399.1	31.85.332.1	600*300	79.06.756.1	31.70.827.1	31.71.827.1	31.85.872.1
300*250	79.06.730.1	31.70.409.1	31.71.409.1	31.85.354.1	600*350	79.06.768.1	31.70.847.1	31.71.847.1	31.85.896.1
350* 50	79.07.006.1				600*400		31.70.889.1	31.71.889.1	31.85.920.1
350* 80	79.07.019.1				600*450		31.70.919.1	31.71.919.1	31.85.944.1
350*100	79.06.678.1				600*500		31.70.949.1	31.71.949.1	31.85.968.1
350*150	79.06.698.1	31.70.417.1	31.71.417.1	31.85.375.1					
350*200	79.06.716.1	31.70.426.1	31.71.426.1	31.85.394.1					
350*250	79.06.732.1	31.70.440.1	31.71.440.1	31.85.419.1					
350*300	79.06.746.1	31.70.450.1	31.71.450.1	31.85.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	321.1	016.1
20	40-600	323.1	018.1
25	40-100	325.1	020.1
	150-600	326.1	024.1
40	50-100	330.1	026.1
	150-600	331.1	028.1
LEVEL	DISPLACER	CHAMBER	
LENGTH	MESCNUMBER		THERMOWELL
-----	-----		LENGTH
			MESCNUMBER
356	76.80.60.102.1		230
813	76.80.60.104.1		255
1219	76.80.60.106.1		305
1524	76.80.60.108.1		355
1829	76.80.60.110.1		405
2134	76.80.60.112.1		455
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

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1  76.62.79.962.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

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* 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  76.83.37.121.1

```

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* 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   76.62.60.537.1
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   76.83.37.122.1

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE        1  76.62.79.962.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.79.964.1

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* VENT POINT                      DN 20 FIG.DE   DN 50 -600
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
MONOFL SINGLE BLOCK NEEDLE       1  77.30.91.044.1

```

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	
50	8	7/8	*	220	61.417.1
80	8	7/8	*	230	61.418.1
100	8	1/8	*	280	61.549.1
150	12	1/8	*	360	61.562.1
200	12	3/8	*	440	61.669.1
250	16	3/8	*	490	61.674.1
300	20	3/8	*	560	83.217.1
350	20	1/2	*	640	83.295.1
400	20	5/8	*	690	83.370.1
450	20	7/8	*	780	83.519.1
500	20	2	*	860	83.595.1

CLASS 91440

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 75 100 120

PRESSURE BAR GA

DN15 -600 137.5 137.5 137.3 136.7

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	160
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	160
300	C	C	C	C	E	E	E	B	B	B	A						80	160
250	C	C	C	C	E	E	E	B	B	A							100	120
200	C	C	C	C	E	E	B	B	A								150	120
150	C	C	C	C	E	B	B	A									200	120
100	C	C	C	B	B	B	A										250	120
80	C	C	C	B	B	A											300	100
50	C	B	B	B	A												350	100
40	B	B	B	A													400	100
25	B	B	A														450	100
20	B	A															500	100
15	A																600	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 SOUR	PLANT :	
CLASS NO. : 91440	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 : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-350	ASTM A106-B
		DN400-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* 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 80-350	ASTM A105
		DN400-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

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	74.30.03	020.1	030.1	040.1	060.1	073.1	113.1	159.1	223.1	263.1	303.1	345.1	393.1					
	74.30.16														145.1	178.1	218.1	248.1
* 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	338.1	340.1	342.1	
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	148.1	150.1	152.1	
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	148.1	150.1	152.1	
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	852.1	854.1	856.1	858.1	860.1	862.1	
* 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	734.1	754.1					
	76.31.17														374.1	390.1	400.1	411.1
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	734.1	754.1					
	76.31.34														374.1	389.1	399.1	409.1
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	734.1	754.1					
	76.31.43														374.1	389.1	399.1	409.1
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	734.1	754.1					
	76.31.80														374.1	389.1	399.1	409.1
* VALVES																		
BALL VALVE FULL BORE TRUN FLGD	77.00.73					658.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	670.1	671.1	673.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.73					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1													
	77.10.23					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1													
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1													
	77.30.23					208.1	160.1	162.1	164.1									
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1												
* 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	486.1	488.1	492.1	
METER RUN	76.64.96	082.1	084.1	086.1	088.1													
ORIFICE FLANGE SET	76.62.95					970.1	886.1	864.1	866.1	868.1	870.1	852.1	854.1	856.1	858.1	860.1	862.1	

	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	79.06.804.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.06.814.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.06.534.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150		29.45.758.1	29.60.758.1	31.88.473.1
40* 20		30.66.181.1	30.67.181.1	30.88.079.1	400*200		29.45.822.1	29.60.822.1	31.88.491.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250		31.66.540.1	31.75.540.1	31.88.513.1
50* 20		30.66.195.1	30.67.195.1	30.88.098.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		30.66.201.1	30.67.201.1	30.88.107.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1	450* 50	79.06.805.1			
80* 40		30.66.231.1	30.67.231.1	30.88.125.1	450* 80	79.06.815.1			
80* 50	79.03.180.1	30.66.241.1	30.67.241.1	30.88.134.1	450*200		31.66.515.1	31.75.516.1	31.88.596.1
100* 40		30.66.256.1	30.67.256.1	30.88.149.1	450*250		31.66.541.1	31.75.541.1	31.88.620.1
100* 50	79.03.001.1	30.66.270.1	30.67.270.1	30.88.161.1	450*300		31.66.557.1	31.75.557.1	31.88.631.1
100* 80	79.03.014.1	30.66.280.1	30.67.280.1	30.88.173.1	450*350		31.66.588.1	31.75.588.1	31.88.655.1
150* 50	79.03.002.1				450*400		31.66.618.1	31.75.618.1	31.88.679.1
150* 80	79.03.015.1	30.66.300.1	30.67.300.1	30.88.185.1	500* 50	79.06.806.1			
150*100	79.02.670.1	30.66.309.1	30.67.309.1	30.88.191.1	500* 80	79.06.816.1			
200* 50	79.03.003.1				500*200	79.06.556.1	29.45.918.1	29.60.916.1	
200* 80	79.03.016.1				500*250		29.45.948.1	29.60.949.1	31.88.740.1
200*100	79.02.672.1	30.66.329.1	30.67.329.1	30.88.207.1	500*300		31.66.647.1	31.75.647.1	31.88.751.1
200*150	79.02.692.1	30.66.339.1	30.67.339.1	30.88.227.1	500*350		31.66.678.1	31.75.678.1	31.88.775.1
250* 50	79.03.004.1				500*400		31.66.708.1	31.75.708.1	31.88.799.1
250* 80	79.03.017.1				500*450		31.66.738.1	31.75.738.1	31.88.823.1
250*100	79.02.674.1	30.66.347.1	30.67.347.1	30.88.255.1	600* 50	79.06.808.1			
250*150	79.02.694.1	30.66.359.1	30.67.359.1	30.88.273.1	600* 80	79.06.818.1			
250*200	79.02.712.1	30.66.369.1	30.67.369.1	30.88.295.1	600*250	79.06.566.1	31.66.815.1	31.75.816.1	
300* 50	79.02.802.1				600*300		31.66.826.1	31.75.826.1	31.88.871.1
300* 80	79.02.812.1				600*350		31.66.846.1	31.75.846.1	31.88.895.1
300*100	79.02.532.1				600*400		31.66.888.1	31.75.888.1	31.88.919.1
300*150		30.66.379.1	30.67.379.1	30.88.321.1	600*450		31.66.918.1	31.75.918.1	31.88.943.1
300*200		30.66.393.1	30.67.393.1	30.88.341.1	600*500		31.66.948.1	31.75.948.1	31.88.967.1
300*250		29.47.540.1	29.62.540.1	30.88.363.1					
350* 50	79.02.803.1								
350* 80	79.02.813.1								
350*100	79.02.533.1								
350*150		29.47.608.1	29.62.608.1	30.88.383.1					
350*200		30.66.429.1	30.67.429.1	30.88.405.1					
350*250		29.47.680.1	29.62.680.1	30.88.428.1					
350*300		30.66.448.1	30.67.448.1	30.88.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	321.1	016.1
20	40-600	323.1	018.1
25	40-100	325.1	020.1
	150-600	326.1	024.1
40	50-100	330.1	026.1
	150-600	331.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.462.1			230 76.83.37.121.1
813	76.80.60.464.1			255 76.83.37.122.1
1219	76.80.60.466.1			305 76.83.37.123.1
1524	76.80.60.468.1			355 76.83.37.125.1
1829	76.80.60.470.1			405 76.83.37.126.1
2134	76.80.60.472.1			455 76.83.37.127.1
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

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ISSUE DATE : DECEMBER 1998

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.063.1
WELDING NECK FLANGE       1      76.62.79.962.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

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* TEMPERATURE INSTR.C.   DN 40   FIG.AA   DN 80 -100
Branch:S (N=br.tab,S=BNIF,N=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                   1  76.83.37.121.1
                                L=230 MM

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* 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   76.62.60.537.1
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   76.83.37.122.1

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE        1  76.62.79.962.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1
WELDING NECK FLANGE       1  76.62.79.964.1

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* VENT POINT                      DN 20 FIG.DE   DN 50 -600
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
MONOFL SINGLE BLOCK NEEDLE       1  77.30.91.044.1

```

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	
50	8	7/8	*	220	66.417.1
80	8	7/8	*	230	66.418.1
100	8	1/8	*	280	66.549.1
150	12	1/8	*	360	66.562.1
200	12	3/8	*	440	66.673.1
250	16	3/8	*	490	66.674.1
300	20	3/8	*	560	86.217.1
350	20	1/2	*	640	86.295.1
400	20	5/8	*	690	86.370.1
450	20	7/8	*	780	86.519.1
500	20	2	*	860	86.595.1

CLASS 91441

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 75 100 120

PRESSURE BAR GA

DN15 -600 137.5 137.5 137.3 136.7

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	E	B	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	E	B	B	A						100	120
200	C	C	C	C	E	E	B	B	A								150	120
150	C	C	C	C	E	B	B	A									200	120
100	C	C	C	B	B	B	A										250	120
80	C	C	C	B	B	A											300	100
50	C	B	B	B	A												350	100
40	B	B	B	A													400	100
25	B	B	A														450	100
20	B	A															500	100
15	A																600	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 SOUR	PLANT :	
CLASS NO. : 91441	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91441, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-350	ASTM A106-B
		DN400-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* 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 80-350	ASTM A105
		DN400-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

91441, REV.A 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	74.30.03	020.1	030.1	040.1	060.1	073.1	113.1	159.1	223.1	263.1	303.1	345.1	393.1				
	74.30.16													145.1	178.1	218.1	248.1
* 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	338.1	340.1	342.1
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	148.1	150.1	152.1
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	148.1	150.1	152.1
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	852.1	854.1	856.1	858.1	860.1	862.1
* 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	734.1	754.1				
	76.31.17													374.1	390.1	400.1	411.1
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	734.1	754.1				
	76.31.34													374.1	389.1	399.1	409.1
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	734.1	754.1				
	76.31.43													374.1	389.1	399.1	409.1
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	734.1	754.1				
	76.31.80													374.1	389.1	399.1	409.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.91					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	670.1	671.1	673.1
BALL VALVE RED. BORE TRUN FLGD	77.00.91					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
CHECK VALVE FLANGED	77.10.43	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	170.1	171.1	173.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.57					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
GATE VALVE FLANGED	77.20.53	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.30.53	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1								
MONOFL SINGLE BLOCK BALL	77.00.97	463.1	464.1	465.1	467.1	468.1											
* 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	486.1	488.1	492.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					970.1	886.1	864.1	866.1	868.1	870.1	852.1	854.1	856.1	858.1	860.1	862.1

	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	79.06.804.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.06.814.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.06.534.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150		29.45.758.1	29.60.758.1	31.88.473.1
40* 20		30.66.181.1	30.67.181.1	30.88.079.1	400*200		29.45.822.1	29.60.822.1	31.88.491.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250		31.66.540.1	31.75.540.1	31.88.513.1
50* 20		30.66.195.1	30.67.195.1	30.88.098.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		30.66.201.1	30.67.201.1	30.88.107.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1	450* 50	79.06.805.1			
80* 40		30.66.231.1	30.67.231.1	30.88.125.1	450* 80	79.06.815.1			
80* 50	79.03.180.1	30.66.241.1	30.67.241.1	30.88.134.1	450*200		31.66.515.1	31.75.516.1	31.88.596.1
100* 40		30.66.256.1	30.67.256.1	30.88.149.1	450*250		31.66.541.1	31.75.541.1	31.88.620.1
100* 50	79.03.001.1	30.66.270.1	30.67.270.1	30.88.161.1	450*300		31.66.557.1	31.75.557.1	31.88.631.1
100* 80	79.03.014.1	30.66.280.1	30.67.280.1	30.88.173.1	450*350		31.66.588.1	31.75.588.1	31.88.655.1
150* 50	79.03.002.1				450*400		31.66.618.1	31.75.618.1	31.88.679.1
150* 80	79.03.015.1	30.66.300.1	30.67.300.1	30.88.185.1	500* 50	79.06.806.1			
150*100	79.02.670.1	30.66.309.1	30.67.309.1	30.88.191.1	500* 80	79.06.816.1			
200* 50	79.03.003.1				500*200	79.06.556.1	29.45.918.1	29.60.916.1	
200* 80	79.03.016.1				500*250		29.45.948.1	29.60.949.1	31.88.740.1
200*100	79.02.672.1	30.66.329.1	30.67.329.1	30.88.207.1	500*300		31.66.647.1	31.75.647.1	31.88.751.1
200*150	79.02.692.1	30.66.339.1	30.67.339.1	30.88.227.1	500*350		31.66.678.1	31.75.678.1	31.88.775.1
250* 50	79.03.004.1				500*400		31.66.708.1	31.75.708.1	31.88.799.1
250* 80	79.03.017.1				500*450		31.66.738.1	31.75.738.1	31.88.823.1
250*100	79.02.674.1	30.66.347.1	30.67.347.1	30.88.255.1	600* 50	79.06.808.1			
250*150	79.02.694.1	30.66.359.1	30.67.359.1	30.88.273.1	600* 80	79.06.818.1			
250*200	79.02.712.1	30.66.369.1	30.67.369.1	30.88.295.1	600*250	79.06.566.1	31.66.815.1	31.75.816.1	
300* 50	79.02.802.1				600*300		31.66.826.1	31.75.826.1	31.88.871.1
300* 80	79.02.812.1				600*350		31.66.846.1	31.75.846.1	31.88.895.1
300*100	79.02.532.1				600*400		31.66.888.1	31.75.888.1	31.88.919.1
300*150		30.66.379.1	30.67.379.1	30.88.321.1	600*450		31.66.918.1	31.75.918.1	31.88.943.1
300*200		30.66.393.1	30.67.393.1	30.88.341.1	600*500		31.66.948.1	31.75.948.1	31.88.967.1
300*250		29.47.540.1	29.62.540.1	30.88.363.1					
350* 50	79.02.803.1								
350* 80	79.02.813.1								
350*100	79.02.533.1								
350*150		29.47.608.1	29.62.608.1	30.88.383.1					
350*200		30.66.429.1	30.67.429.1	30.88.405.1					
350*250		29.47.680.1	29.62.680.1	30.88.428.1					
350*300		30.66.448.1	30.67.448.1	30.88.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	321.1	016.1
20	40-600	323.1	018.1
25	40-100	325.1	020.1
	150-600	326.1	024.1
40	50-100	330.1	026.1
	150-600	331.1	028.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.462.1			230 76.83.37.121.1
813	76.80.60.464.1			255 76.83.37.122.1
1219	76.80.60.466.1			305 76.83.37.123.1
1524	76.80.60.468.1			355 76.83.37.125.1
1829	76.80.60.470.1			405 76.83.37.126.1
2134	76.80.60.472.1			455 76.83.37.127.1
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 FOR LAP FLANGES

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					
25	4	7/8	* 130	66.403.1					
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					
450	20	1 7/8	* 330	66.786.1					
500	20	2	* 410	66.825.1					
600	20	2 1/2	* 520	86.703.1					

BOLTSET METER-RUN

BOLTSET ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	66.330.1					
20	4	3/4	* 120	66.332.1					
25	4	7/8	* 130	66.403.1					
40	4	1	* 140	66.469.1					
					50	8	7/8	* 160	66.407.1
					80	8	7/8	* 160	66.407.1
					100	8	1 1/8	* 180	66.533.1
					150	12	1 1/8	* 210	66.538.1
					200	12	1 3/8	* 240	66.646.1
					250	16	1 3/8	* 250	66.647.1
					300	20	1 3/8	* 280	66.652.1
					350	20	1 1/2	* 300	66.696.1
					400	20	1 5/8	* 310	66.727.1
					450	20	1 7/8	* 350	66.789.1
					500	20	2	* 440	66.829.1
					600	20	2 1/2	* 540	86.705.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

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	* 220	66.417.1
80	8	7/8	* 170	66.409.1	80	8	7/8	* 230	66.418.1
100	8	1 1/8	* 200	66.525.1	100	8	1 1/8	* 280	66.549.1
150	12	1 1/8	* 230	66.541.1	150	12	1 1/8	* 360	66.562.1
200	12	1 3/8	* 270	66.662.1	200	12	1 3/8	* 440	66.673.1
250	16	1 3/8	* 290	66.654.1	250	16	1 3/8	* 490	66.674.1
300	20	1 3/8	* 310	66.656.1	300	20	1 3/8	* 560	86.217.1
350	20	1 1/2	* 350	66.704.1	350	20	1 1/2	* 640	86.295.1
400	20	1 5/8	* 360	66.736.1	400	20	1 5/8	* 690	86.370.1
450	20	1 7/8	* 420	66.802.1	450	20	1 7/8	* 780	86.519.1
500	20	2	* 500	86.561.1	500	20	2	* 860	86.595.1
600	20	2 1/2	* 620	86.713.1					

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.463.1	
WELDING NECK FLANGE	1	76.62.79.962.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.464.1	
WELDING NECK FLANGE	1	76.62.79.964.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK BALL	1	77.00.97.464.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -600
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.363.1	
WELDING NECK FLANGE	2	76.62.79.962.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.363.1	
WELDING NECK FLANGE	1	76.62.79.962.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.363.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.363.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.363.1	
WELDING NECK FLANGE	1	76.62.79.962.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.363.1	
* 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	76.83.37.121.1	
* 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	76.62.60.537.1	
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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.043.1	
WELDING NECK FLANGE	1	76.62.79.962.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.044.1	
WELDING NECK FLANGE	1	76.62.79.964.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.044.1	

CLASS 91450

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	120	150	200

	PRESSURE BAR GA						
DN15 -600	153.0	150.1	144.0	139.1	137.8	135.7	131.3

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.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

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 80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	A	20 80	
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A		25 80	
400	C	C	C	C	E	E	E	E	B	B	B	B	A			40 80	
350	C	C	C	C	E	E	E	B	B	B	B	A				50 80	
300	C	C	C	C	E	E	E	B	B	B	A					80 80	
250	C	C	C	C	E	E	E	B	B	A						100 80	
200	C	C	C	C	E	E	B	B	A							150 120	
150	C	C	C	C	E	B	B	A								200 100	
100	C	C	C	B	B	B	A									250 100	
80	C	C	C	B	B	A										300 100	
50	C	B	B	B	A											350 100	
40	B	B	B	A												400 100	
25	B	B	A													450 100	
20	B	A														500 100	
15	A															600 100	

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	PLANT	:	
CLASS NO. : 91450	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91450, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-350	ASTM A106-B
		DN400-600	ASTM A333-6

* 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 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* 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 80-350	ASTM A105
		DN400-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-400	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			BODY: ASTM A216-WCB/WCC,A105
			TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-150	TRIM: AISI 316(L),STELLITE 6
			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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	223.1	259.1	299.1	345.1	393.1					
	74.30.17														145.1	180.1	216.1	248.1
* 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	338.1	340.1	342.1	
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	148.1	150.1	152.1	
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	148.1	150.1	152.1	
WELDING NECK FLANGE	76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	866.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1	
* FITTINGS																		
CAP BUTT-WELD.END	76.30.19	018.1	024.1	030.1	038.1	058.1	078.1	098.1	120.1	140.1	161.1	184.1	204.1					
	76.31.18														374.1	390.1	400.1	411.1
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	690.1	711.1	734.1	754.1					
	76.31.38														374.1	390.1	400.1	411.1
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	690.1	711.1	734.1	754.1					
	76.31.39														374.1	391.1	401.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	568.1	574.1	580.1	588.1	608.1	628.1	648.1	670.1	690.1	711.1	734.1	754.1					
	76.31.84														374.1	392.1	402.1	412.1
* VALVES																		
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1													
	77.10.23					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1													
	77.20.23					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1	
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1													
	77.30.23					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	486.1	488.1	492.1	
METER RUN	76.64.96	082.1	084.1	086.1	088.1													
ORIFICE FLANGE SET	76.62.95					910.1	832.1	834.1	866.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1	

	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	79.05.547.1			
25* 15		30.72.147.1	30.73.147.1	30.89.045.1	400* 80	79.05.560.1			
25* 20		30.72.157.1	30.73.157.1	30.89.055.1	400*100	79.05.572.1			
40* 15		30.72.167.1	30.73.167.1	30.89.065.1	400*150		29.44.766.1	29.59.757.1	31.85.473.1
40* 20		30.72.177.1	30.73.177.1	30.89.075.1	400*200		31.70.456.1	30.73.456.1	31.85.482.1
40* 25		30.72.187.1	30.73.187.1	30.89.085.1	400*250		31.70.465.1	30.73.465.1	31.85.508.1
50* 20		30.72.194.1	30.73.194.1	30.89.097.1	400*300		31.70.477.1	31.71.477.1	31.85.534.1
50* 25		30.72.197.1	30.73.197.1	30.89.106.1	400*350		31.70.488.1	31.71.488.1	31.85.559.1
50* 40		30.72.207.1	30.73.207.1	30.89.115.1	450* 80	79.05.561.1			
80* 40		30.72.227.1	30.73.227.1	30.89.124.1	450*100	79.05.573.1			
80* 50	79.01.360.1	30.72.237.1	30.73.237.1	30.89.133.1	450*200		31.70.506.1	31.71.506.1	31.85.583.1
100* 40		30.72.251.1	30.73.251.1	30.89.142.1	450*250		31.70.527.1	31.71.527.1	31.85.607.1
100* 50	79.01.362.1	30.72.267.1	30.73.267.1	30.89.154.1	450*300		31.70.557.1	31.71.557.1	31.85.631.1
100* 80	79.01.386.1	30.72.277.1	30.73.277.1	30.89.166.1	450*350		31.70.588.1	31.71.588.1	31.85.655.1
150* 50	79.02.358.1				450*400		31.70.618.1	31.71.618.1	31.85.679.1
150* 80	79.02.382.1	30.72.299.1	30.73.299.1	30.89.184.1	500* 80	79.05.562.1			
150*100	79.02.404.1	30.72.310.1	30.73.301.1	30.89.198.1	500*100	79.05.574.1			
200* 50	79.01.543.1				500*200		29.44.905.1	29.59.905.1	31.85.703.1
200* 80	79.01.556.1				500*250		31.70.637.1	29.59.935.1	31.85.727.1
200*100		30.72.330.1	30.73.330.1	30.89.216.1	500*300		31.70.647.1	31.71.647.1	31.85.751.1
200*150		30.72.338.1	30.73.338.1	30.89.237.1	500*350		31.70.678.1	31.71.678.1	31.85.775.1
250* 50	79.01.544.1				500*400		31.70.708.1	31.71.708.1	31.85.799.1
250* 80	79.01.557.1				500*450		31.70.738.1	31.71.738.1	31.85.823.1
250*100		29.46.350.1	29.61.350.1	30.89.263.1	600* 80	79.05.564.1			
250*150		30.72.351.1	30.73.351.1	30.89.281.1	600*100	79.05.576.1			
250*200		30.72.367.1	30.73.367.1	30.89.294.1	600*200	79.05.699.1			
300* 50	79.01.545.1				600*250	79.05.705.1	31.70.806.1	31.71.806.1	31.85.847.1
300* 80	79.01.558.1				600*300		31.70.826.1	31.71.826.1	31.85.871.1
300*100	79.01.570.1				600*350		31.70.846.1	31.71.846.1	31.85.895.1
300*150		30.72.379.1	30.73.379.1	30.89.321.1	600*400		31.70.888.1	31.71.888.1	31.85.919.1
300*200		30.72.397.1	30.73.397.1	30.89.331.1	600*450		31.70.918.1	31.71.918.1	31.85.943.1
300*250		30.72.407.1	30.73.407.1	30.89.353.1	600*500		31.70.948.1	31.71.948.1	31.85.967.1
350* 50	79.01.546.1								
350* 80	79.01.559.1								
350*100	79.01.571.1								
350*150		29.46.608.1	29.61.608.1	30.89.383.1					
350*200		30.72.425.1	30.73.425.1	30.89.393.1					
350*250		30.72.437.1	30.73.437.1	30.89.418.1					
350*300		30.72.448.1	30.73.448.1	30.89.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	301.1	001.1
	200-600	302.1	002.1
20	40- 80	303.1	003.1
	100-600	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-600	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
	350-600	314.1	014.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.102.1			230 76.83.37.121.1
813	76.80.60.104.1			255 76.83.37.122.1
1219	76.80.60.106.1			305 76.83.37.123.1
1524	76.80.60.108.1			355 76.83.37.125.1
1829	76.80.60.110.1			405 76.83.37.126.1
2134	76.80.60.112.1			455 76.83.37.127.1
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							
450	20	1 7/8	* 330	61.786.1							
500	20	2	* 410	61.825.1							
600	20	2 1/2	* 520	83.703.1							

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
450	20	1 7/8	*	350	61.789.1		450	20	1 7/8	*	420	61.802.1
500	20	2	*	440	61.829.1		500	20	2	*	500	83.561.1
600	20	2 1/2	*	540	83.705.1		600	20	2 1/2	*	620	83.713.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	7/8	* 220	61.417.1
80	8	7/8	* 230	61.418.1
100	8	1 1/8	* 280	61.549.1
150	12	1 1/8	* 360	61.562.1
200	12	1 3/8	* 440	61.669.1
250	16	1 3/8	* 490	61.674.1
300	20	1 3/8	* 560	83.217.1
350	20	1 1/2	* 640	83.295.1
400	20	1 5/8	* 690	83.370.1
450	20	1 7/8	* 780	83.519.1
500	20	2	* 860	83.595.1

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:=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.0H	DN 50 -600
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 INTR.CONN.      DN 15  FIG.0I  DN 50 -600
Branch: (:N=br.tab;S=BNIF,=N/A) 1 (PIPING COMP.)
GASKET, SPIRAL WOUND      4  85.41.46.504.1
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
WELDING NECK FLANGE       2  76.62.79.902.1

```

```

* PRESSURE INSTR.CONN.      DN 15  FIG.OI  DN 15 - 40
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
                             4  81.38.61.330.1
WELDING NECK FLANGE         1  76.62.79.902.1

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```

* PRESSURE INSTR.CONN.      DN 15  FIG.01  DN 50 -600
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
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  77.20.04.203.1
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

```

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* 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                  1  76.83.37.121.1
                                L=230 MM

```

```

* 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  76.62.60.537.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                  4  81.38.61.472.1
THERMOWELL STRAIGHT                  1  76.83.37.122.1
L=255 MM

```

```

* VENT POINT                DN 15 FIG.11    DN 15 - 25
Branch:N (:N=br.tab,:S=BNI,F,: =N/A) 1(P1PING 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

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* VENT POINT                      DN 20 FIG.11      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

```

CLASS 91460

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 75 100 120 150 200

PRESSURE BAR GA

DN15 -600 137.5 137.5 137.3 136.7 135.7 131.3

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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	B	B	B	B	B	A	15	80
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	80
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	80
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	80
350	C	C	C	C	E	E	E	B	B	B	B	A					50	80
300	C	C	C	C	E	E	E	B	B	B	A						80	80
250	C	C	C	C	E	E	E	B	B	A							100	80
200	C	C	C	C	E	E	B	B	A								150	80
150	C	C	C	C	E	B	B	A									200	100
100	C	C	C	B	B	B	A										250	100
80	C	C	C	B	B	A											300	100
50	C	B	B	B	A												350	100
40	B	B	B	A													400	100
25	B	B	A														450	100
20	B	A															500	100
15	A																600	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 SOUR	PLANT :	
CLASS NO. : 91460	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91460, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-350	ASTM A106-B
		DN400-600	ASTM A333-6

* 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 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* 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 80-350	ASTM A105
		DN400-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			BODY: ASTM A216-WCB/WCC,A105
			TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-150	TRIM: AISI 316(L),STELLITE 6
			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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWGS	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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	259.1	299.1	345.1	393.1					
	74.30.16														145.1	178.1	218.1	248.1
* 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	338.1	340.1	342.1	
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	148.1	150.1	152.1	
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	148.1	150.1	152.1	
WELDING NECK FLANGE	76.62.79	902.1	904.1	906.1	908.1	910.1	832.1	834.1	836.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1	
* FITTINGS																		
CAP BUTT-WELD.END	76.30.17	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	690.1	711.1	734.1	754.1					
	76.31.17														374.1	390.1	400.1	411.1
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	690.1	711.1	734.1	754.1					
	76.31.34														374.1	389.1	399.1	409.1
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	690.1	711.1	734.1	754.1					
	76.31.43														374.1	389.1	399.1	409.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	568.1	574.1	580.1	588.1	608.1	628.1	648.1	668.1	690.1	711.1	734.1	754.1					
	76.31.80														374.1	389.1	399.1	409.1
* VALVES																		
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1													
	77.10.23						208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51						208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1													
	77.20.23						208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1													
	77.30.23						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	486.1	488.1	492.1	
METER RUN	76.64.96	082.1	084.1	086.1	088.1													
ORIFICE FLANGE SET	76.62.95					910.1	832.1	834.1	836.1	848.1	850.1	852.1	854.1	856.1	858.1	860.1	862.1	

	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	79.05.547.1			
25* 15		30.66.147.1	30.67.147.1	30.88.045.1	400* 80	79.05.560.1			
25* 20		30.66.157.1	30.67.157.1	30.88.055.1	400*100	79.05.572.1			
40* 15		30.66.167.1	30.67.167.1	30.88.065.1	400*150		29.45.756.1	29.60.756.1	
40* 20		30.66.177.1	30.67.177.1	30.88.075.1	400*200		31.66.456.1	31.75.456.1	31.88.482.1
40* 25		30.66.187.1	30.67.187.1	30.88.085.1	400*250		31.66.465.1	31.75.465.1	31.88.508.1
50* 20		30.66.194.1	30.67.194.1	30.88.097.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		30.66.197.1	30.67.197.1	30.88.106.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		30.66.207.1	30.67.207.1	30.88.115.1	450* 80	79.05.561.1			
80* 40		30.66.227.1	30.67.227.1	30.88.124.1	450*100	79.05.573.1			
80* 50	79.01.360.1	30.66.237.1	30.67.237.1	30.88.133.1	450*150	79.05.585.1			
100* 40		30.66.251.1	30.67.251.1	30.88.142.1	450*200		31.66.506.1	31.75.506.1	31.88.583.1
100* 50	79.01.362.1	30.66.267.1	30.67.267.1	30.88.154.1	450*250		31.66.527.1	31.75.527.1	31.88.607.1
100* 80	79.01.386.1	30.66.277.1	30.67.277.1	30.88.166.1	450*300		31.66.557.1	31.75.557.1	31.88.631.1
150* 50	79.01.364.1				450*350		31.66.588.1	31.75.588.1	31.88.655.1
150* 80	79.01.388.1	30.66.297.1	30.67.297.1	30.88.178.1	450*400		31.66.618.1	31.75.618.1	31.88.679.1
150*100	79.01.410.1	30.66.307.1	30.67.307.1	30.88.190.1	500* 80	79.05.562.1			
200* 50	79.01.543.1				500*100	79.05.574.1			
200* 80	79.01.556.1				500*150	79.05.586.1			
200*100		30.66.330.1	30.67.330.1	30.88.216.1	500*200	79.05.698.1	29.45.905.1	29.60.905.1	31.88.703.1
200*150		29.47.320.1	29.62.320.1	30.88.236.1	500*250		29.45.938.1	29.60.939.1	31.88.727.1
250* 50	79.01.544.1				500*300		31.66.647.1	31.75.647.1	31.88.751.1
250* 80	79.01.557.1				500*350		31.66.678.1	31.75.678.1	31.88.775.1
250*100		29.47.350.1	29.62.350.1	30.88.263.1	500*400		31.66.708.1	31.75.708.1	31.88.799.1
250*150		30.66.354.1	30.67.354.1	30.88.280.1	500*450		31.66.738.1	31.75.738.1	31.88.823.1
250*200		30.66.367.1	30.67.367.1	30.88.294.1	600* 80	79.05.564.1			
300* 50	79.01.545.1				600*100	79.05.576.1			
300* 80	79.01.558.1				600*150	79.05.588.1			
300*100	79.01.570.1				600*200	79.05.699.1			
300*150		29.47.465.1	29.62.465.1	30.88.320.1	600*250	79.05.705.1	31.66.806.1	31.75.806.1	31.88.847.1
300*200		30.66.397.1	30.67.397.1	30.88.331.1	600*300		31.66.826.1	31.75.826.1	31.88.871.1
300*250		30.66.407.1	30.67.407.1	30.88.353.1	600*350		31.66.846.1	31.75.846.1	31.88.895.1
350* 50	79.01.546.1				600*400		31.66.888.1	31.75.888.1	31.88.919.1
350* 80	79.01.559.1				600*450		31.66.918.1	31.75.918.1	31.88.943.1
350*100	79.01.571.1				600*500		31.66.948.1	31.75.948.1	31.88.967.1
350*150		29.47.606.1	29.62.606.1	30.88.382.1					
350*200		30.66.425.1	30.67.425.1	30.88.393.1					
350*250		30.66.437.1	30.67.437.1	30.88.418.1					
350*300		30.66.448.1	30.67.448.1	30.88.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-150	301.1	001.1
	200-600	302.1	002.1
20	40- 80	303.1	003.1
	100-600	304.1	004.1
25	40- 40	305.1	005.1
	50- 50	306.1	006.1
	80-100	307.1	007.1
	150-600	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
	350-600	314.1	014.1

LEVEL	DISPLACER	CHAMBER	THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.462.1		230	76.83.37.121.1
813	76.80.60.464.1		255	76.83.37.122.1
1219	76.80.60.466.1		305	76.83.37.123.1
1524	76.80.60.468.1		355	76.83.37.125.1
1829	76.80.60.470.1		405	76.83.37.126.1
2134	76.80.60.472.1		455	76.83.37.127.1
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

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* 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

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* 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                  1  76.83.37.121.1
                                L=230 MM

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* TEMPERATURE INSTR.C.      DN 40   FIG.BB   DN150 -600
Branch:S (:N=br.tab,S=BNIF,:=N/A) 1(PIPING COMM.)
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 76.83.37.122.1

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* VENT POINT	DN 15	FIG.11	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.11	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	FG.1H	DN 50 -600
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 91470

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -400	143.7	143.7	142.0	138.4	135.3	134.0

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.
- 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
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
- FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	E	B	B	A		
200	C	C	C	C	E	E	E	B	B	A			
150	C	C	C	C	E	E	B	B	A				
100	C	C	C	C	B	B	B	A					
80	C	C	C	B	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	80
20	80
25	80
40	80
50	80
80	80
100	80
150	80
200	100
250	100
300	100
350	100
400	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 LOW TEMP.	PLANT :	
CLASS NO. : 91470	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 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	MONEL 400

PIPING COMPONENTS

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		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	061.1	069.1	077.1	086.1	099.1	111.1	123.1	136.1	145.1
* 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	634.1	636.1
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	534.1	536.1
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	634.1	636.1
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	394.1	396.1
* 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	354.1	374.1
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	354.1	374.1
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	354.1	374.1
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	354.1	374.1
* VALVES														
BALL VALVE FB TRUNNION NON EXT	77.00.85					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1
BALL VALVE RB TRUNNION NON EXT	77.00.85					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
BALL VALVE FULL BORE TRUN FLGD	77.00.82					658.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1
BALL VALVE RED. BORE TRUN FLGD	77.00.82					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
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	168.1	169.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
GATE VALVE FLANGED	77.20.33	203.1	204.1	205.1	207.1									
GLOBE VALVE FLANGED	77.30.33	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1					
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1								
* 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	76.64.96	082.1	084.1	086.1	088.1									
ORIFICE FLANGE SET	76.62.97					910.1	832.1	834.1	836.1	848.1	850.1	852.1	854.1	856.1

	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	79.05.547.1			
25* 15		31.70.147.1	31.71.147.1	31.85.045.1	400* 80	79.05.560.1			
25* 20		31.70.157.1	31.71.157.1	31.85.055.1	400*100	79.05.572.1			
40* 15		31.70.167.1	31.71.167.1	31.85.065.1	400*150		29.44.756.1	29.59.756.1	31.85.472.1
40* 20		31.70.177.1	31.71.177.1	31.85.075.1	400*200		31.70.456.1	31.71.456.1	31.85.482.1
40* 25		31.70.187.1	31.71.187.1	31.85.085.1	400*250		31.70.465.1	31.71.465.1	31.85.508.1
50* 20		31.70.194.1	31.71.194.1	31.85.097.1	400*300		31.70.477.1	31.71.477.1	31.85.534.1
50* 25		31.70.197.1	31.71.197.1	31.85.106.1	400*350		31.70.488.1	31.71.488.1	31.85.559.1
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					
350* 50	79.05.546.1								
350* 80	79.05.559.1								
350*100	79.05.571.1								
350*150		29.44.606.1	29.59.606.1	31.85.382.1					
350*200		31.70.425.1	31.71.425.1	31.85.393.1					
350*250		31.70.437.1	31.71.437.1	31.85.418.1					
350*300		31.70.448.1	31.71.448.1	31.85.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	801.1	101.1
	200-400	802.1	102.1
20	40- 80	803.1	103.1
	100-400	804.1	104.1
25	40- 40	805.1	105.1
	50- 50	806.1	106.1
	80-100	807.1	107.1
	150-400	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
	350-400	814.1	114.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.302.1		230	76.83.37.121.1
813	76.80.60.304.1		255	76.83.37.122.1
1219	76.80.60.306.1		305	76.83.37.123.1
1524	76.80.60.308.1		355	76.83.37.125.1
1829	76.80.60.310.1		405	76.83.37.126.1
2134	76.80.60.312.1		455	76.83.37.127.1
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

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	1/8	* 170	63.532.1					
150	12	1/8	* 190	63.535.1					
200	12	1/8	* 220	63.643.1					
250	16	1/8	* 240	63.646.1					
300	20	1/8	* 250	63.647.1					
350	20	1/2	* 280	63.693.1					
400	20	1/2	* 290	63.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	3/4	*	120
					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	3/8	*	240	200	12	3/8	*	270
250	16	3/8	*	250	250	16	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	5/8	*	310	400	20	5/8	*	360

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	* MM		
50	8	7/8	*	220	63.417.1
80	8	7/8	*	230	63.418.1
100	8	1/8	*	280	63.549.1
150	12	1/8	*	360	63.562.1
200	12	3/8	*	440	63.666.1
250	16	3/8	*	490	63.674.1
300	20	3/8	*	560	63.669.1
350	20	1/2	*	640	63.716.1
400	20	5/8	*	690	63.754.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE   1  76.62.86.552.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.464.1
WELDING NECK FLANGE    1  76.62.86.554.1

```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.86.552.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.552.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE        1    76.62.86.552.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

```

* 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                   1      76.83.37.121.1
                                L=230 MM

```

```

* 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   76.62.52.537.1
GASKET, SPIRAL WOUND              1   85.41.46.512.1
STUD BOLT WITH NUTS               4   81.38.63.472.1
THERMOWELL STRAIGHT               1   76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE        1  76.62.86.552.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.86.554.1

```

* VENT POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1		

CLASS 91480

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 0 50 75 100 120

PRESSURE BAR GA

DN15 -400 137.5 137.5 137.1 136.3 135.3 134.0

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
- FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
- FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
- 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
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B B B B A
350	C	C	C	C	E	E	E	B	B	B B A
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	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	80
20	80
25	80
40	80
50	80
80	80
100	80
150	80
200	100
250	100
300	100
350	100
400	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 LOW TEMP. SOUR	PLANT :	
CLASS NO. : 91480	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91480, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE															
PIPE	74.30.16	021.1	029.1	037.1	053.1	061.1	069.1	077.1	086.1	099.1	111.1	123.1	136.1	145.1	
* 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	634.1	636.1	
SPECTACLE BLIND FLANGE	76.88.35	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)	76.88.47	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	
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	394.1	396.1	
* FITTINGS															
CAP BUTT-WELD.END	76.31.17	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1	290.1	311.1	334.1	354.1	374.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1	290.1	311.1	334.1	354.1	374.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1	290.1	311.1	334.1	354.1	374.1	
EQUAL TEE BUTT-WELD ENDS	76.31.80	168.1	174.1	180.1	188.1	210.1	230.1	248.1	268.1	290.1	311.1	334.1	354.1	374.1	
* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.00.85					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RB TRUNNION NON EXT	77.00.85					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
BALL VALVE FULL BORE TRUN FLGD	77.00.82					658.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.82					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
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	168.1	169.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.33	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.33	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1									
* 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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.97					910.1	832.1	834.1	836.1	848.1	850.1	852.1	854.1	856.1	

	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	79.05.547.1			
25* 15		31.66.147.1	31.75.147.1	31.88.045.1	400* 80	79.05.560.1			
25* 20		31.66.157.1	31.75.157.1	31.88.055.1	400*100	79.05.572.1			
40* 15		31.66.167.1	31.75.167.1	31.88.065.1	400*150		29.45.756.1	29.60.756.1	31.88.472.1
40* 20		31.66.177.1	31.75.177.1	31.88.075.1	400*200		31.66.456.1	31.75.456.1	31.88.482.1
40* 25		31.66.187.1	31.75.187.1	31.88.085.1	400*250		31.66.465.1	31.75.465.1	31.88.508.1
50* 20		31.66.194.1	31.75.194.1	31.88.097.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		31.66.197.1	31.75.197.1	31.88.106.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		31.66.207.1	31.75.207.1	31.88.115.1					
80* 40		31.66.227.1	31.75.227.1	31.88.124.1					
80* 50	79.05.360.1	31.66.237.1	31.75.237.1	31.88.133.1					
100* 40		31.66.251.1	31.75.251.1	31.88.142.1					
100* 50	79.05.362.1	31.66.267.1	31.75.267.1	31.88.154.1					
100* 80	79.05.386.1	31.66.277.1	31.75.277.1	31.88.166.1					
150* 50	79.05.364.1								
150* 80	79.05.388.1	31.66.297.1	31.75.297.1	31.88.178.1					
150*100	79.05.410.1	31.66.307.1	31.75.307.1	31.88.190.1					
200* 50	79.05.543.1								
200* 80	79.05.556.1								
200*100	79.05.568.1	31.66.330.1	31.75.330.1	31.88.216.1					
200*150	79.05.580.1	31.66.340.1	31.75.340.1	31.88.236.1					
250* 50	79.05.544.1								
250* 80	79.05.557.1								
250*100	79.05.569.1	29.45.350.1	29.60.350.1	31.88.263.1					
250*150	79.05.581.1	31.66.354.1	31.75.354.1	31.88.280.1					
250*200	79.05.693.1	31.66.368.1	31.75.368.1	31.88.294.1					
300* 50	79.05.545.1								
300* 80	79.05.558.1								
300*100	79.05.570.1								
300*150	79.05.582.1	29.45.465.1	29.60.465.1	31.88.320.1					
300*200	79.05.694.1	31.66.398.1	31.75.398.1	31.88.331.1					
300*250	79.05.700.1	31.66.407.1	31.75.407.1	31.88.353.1					
350* 50	79.05.546.1								
350* 80	79.05.559.1								
350*100	79.05.571.1								
350*150		29.45.606.1	29.60.606.1	31.88.382.1					
350*200		31.66.425.1	31.75.425.1	31.88.393.1					
350*250		31.66.437.1	31.75.437.1	31.88.418.1					
350*300		31.66.448.1	31.75.448.1	31.88.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-150	801.1	101.1
	200-400	802.1	102.1
20	40- 80	803.1	103.1
	100-400	804.1	104.1
25	40- 40	805.1	105.1
	50- 50	806.1	106.1
	80-100	807.1	107.1
	150-400	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
	350-400	814.1	114.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.642.1		230	76.83.37.121.1
813	76.80.60.644.1		255	76.83.37.122.1
1219	76.80.60.646.1		305	76.83.37.123.1
1524	76.80.60.648.1		355	76.83.37.125.1
1829	76.80.60.650.1		405	76.83.37.126.1
2134	76.80.60.652.1		455	76.83.37.127.1
2438	76.80.60.654.1			
2743	76.80.60.656.1			
3048	76.80.60.658.1			

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

BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 110	67.330.1	15	4	3/4	* 110	67.330.1
20	4	3/4	* 110	67.330.1	20	4	3/4	* 120	67.332.1
25	4	7/8	* 130	67.403.1	25	4	7/8	* 130	67.403.1
40	4	1	* 140	67.469.1	40	4	1	* 140	67.469.1
50	8	7/8	* 150	67.406.1					
80	8	7/8	* 150	67.406.1					
100	8	1/8	* 170	67.532.1					
150	12	1/8	* 190	67.535.1					
200	12	3/8	* 220	67.643.1					
250	16	3/8	* 240	67.646.1					
300	20	3/8	* 250	67.647.1					
350	20	1/2	* 280	67.693.1					
400	20	5/8	* 290	67.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	3/4	*	120
					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	3/8	*	240	200	12	3/8	*	270
250	16	3/8	*	250	250	16	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	5/8	*	310	400	20	5/8	*	360

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	
50	8	7/8	*	220	67.417.1
80	8	7/8	*	230	67.418.1
100	8	1 1/8	*	280	67.549.1
150	12	1 1/8	*	360	67.562.1
200	12	1 3/8	*	440	67.672.1
250	16	1 3/8	*	490	67.677.1
300	20	1 3/8	*	560	67.680.1
350	20	1 1/2	*	640	67.715.1
400	20	1 5/8	*	690	67.769.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.86.552.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.454.1
WELDING NECK FLANGE    1  76.62.86.554.1

```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.86.552.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.552.1
```

```
* PI ON PIPING CL COUP    DN 15    FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE        1    76.62.86.552.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

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* 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  81.38.67.472.1
THERMOWELL STRAIGHT                   1  76.83.37.121.1
                                L=230 MM

```

```

* 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   76.62.52.537.1
GASKET, SPIRAL WOUND                 1   85.41.46.512.1
STUD BOLT WITH NUTS                   4   81.38.67.472.1
THERMOWELL STRAIGHT                   1   76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE         1  76.62.86.552.1

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```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE         1  76.62.86.554.1

```

* VENT POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1		

CLASS 91490

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -400	143.7	143.7	142.0	138.4	135.3	134.0

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
 - FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	E	B	B	A		
200	C	C	C	C	E	E	E	B	B	A			
150	C	C	C	C	E	E	B	B	A				
100	C	C	C	C	B	B	B	A					
80	C	C	C	B	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	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 LOW TEMP.	PLANT :	
CLASS NO. : 91490	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91490, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 91490, REV.B PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE															
PIPE	74.30.17	023.1	030.1	038.1	054.1	063.1	071.1	078.1	087.1	100.1	112.1	124.1	137.1	146.1	
* 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	634.1	636.1	
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	534.1	536.1	
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	634.1	636.1	
WELDING NECK FLANGE	76.62.86	662.1	664.1	666.1	668.1	670.1	472.1	414.1	416.1	418.1	420.1	422.1	424.1	426.1	
* FITTINGS															
CAP BUTT-WELD.END	76.31.18	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	335.1	355.1	375.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.38	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	335.1	355.1	375.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.39	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	335.1	355.1	375.1	
EQUAL TEE BUTT-WELD ENDS	76.31.84	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	335.1	355.1	375.1	
* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.00.86					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RB TRUNNION NON EXT	77.00.86					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
BALL VALVE FULL BORE TRUN FLGD	77.00.83					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.83					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
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	168.1	169.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.33	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.33	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1									
* 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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.97					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		31.70.141.1	31.71.141.1	31.85.039.1	400* 50	79.07.007.1			
25* 15		31.70.151.1	31.71.151.1	31.85.049.1	400* 80	79.07.020.1			
25* 20		31.70.161.1	31.71.161.1	31.85.059.1	400*100	79.06.680.1			
40* 15		31.70.171.1	31.71.171.1	31.85.069.1	400*150	79.06.700.1	29.44.742.1	29.59.742.1	31.85.465.1
40* 20		31.70.181.1	31.71.181.1	31.85.079.1	400*200	79.06.718.1	31.70.457.1	31.71.457.1	31.85.483.1
40* 25		31.70.191.1	31.71.191.1	31.85.089.1	400*250	79.06.734.1	31.70.466.1	31.71.466.1	31.85.509.1
50* 20		31.70.195.1	31.71.195.1	31.85.098.1	400*300	79.06.748.1	31.70.476.1	31.71.476.1	31.85.535.1
50* 25		31.70.201.1	31.71.201.1	31.85.107.1	400*350	79.06.760.1	31.70.490.1	31.71.490.1	31.85.560.1
50* 40		31.70.211.1	31.71.211.1	31.85.116.1					
80* 40		31.70.231.1	31.71.231.1	31.85.125.1					
80* 50	79.07.180.1	31.70.241.1	31.71.241.1	31.85.134.1					
100* 40		31.70.254.1	31.71.254.1	31.85.149.1					
100* 50	79.07.001.1	31.70.270.1	31.71.270.1	31.85.161.1					
100* 80		31.70.280.1	31.71.280.1	31.85.173.1					
150* 50	79.07.002.1								
150* 80		31.70.300.1	31.71.300.1	31.85.185.1					
150*100	79.06.670.1	31.70.309.1	31.71.309.1	31.85.191.1					
200* 50	79.07.003.1								
200* 80	79.07.016.1								
200*100	79.06.672.1	31.70.329.1	31.71.329.1	31.85.207.1					
200*150	79.06.692.1	31.70.339.1	31.71.339.1	31.85.227.1					
250* 50	79.07.004.1								
250* 80	79.07.017.1								
250*100	79.06.674.1	31.70.347.1	31.71.347.1	31.85.255.1					
250*150	79.06.694.1	31.70.359.1	31.71.359.1	31.85.273.1					
250*200	79.06.712.1	31.70.369.1	31.71.369.1	31.85.295.1					
300* 50	79.07.005.1								
300* 80	79.07.018.1								
300*100	79.06.676.1								
300*150	79.06.696.1	31.70.387.1	31.71.387.1	31.85.312.1					
300*200	79.06.714.1	31.70.399.1	31.71.399.1	31.85.332.1					
300*250	79.06.730.1	31.70.409.1	31.71.409.1	31.85.354.1					
350* 50	79.07.006.1								
350* 80	79.07.019.1								
350*100	79.06.678.1								
350*150	79.06.698.1	31.70.417.1	31.71.417.1	31.85.375.1					
350*200	79.06.716.1	31.70.426.1	31.71.426.1	31.85.394.1					
350*250	79.06.732.1	31.70.440.1	31.71.440.1	31.85.419.1					
350*300	79.06.746.1	31.70.450.1	31.71.450.1	31.85.445.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	821.1	116.1
20	40-400	823.1	118.1
25	40-100	825.1	120.1
	150-400	826.1	124.1
40	50-100	830.1	126.1
	150-400	831.1	128.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.302.1		230	76.83.37.121.1
813	76.80.60.304.1		255	76.83.37.122.1
1219	76.80.60.306.1		305	76.83.37.123.1
1524	76.80.60.308.1		355	76.83.37.125.1
1829	76.80.60.310.1		405	76.83.37.126.1
2134	76.80.60.312.1		455	76.83.37.127.1
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

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
20	4	3/4	*	110	63.330.1	20	4	3/4	*	120
25	4	7/8	*	130	63.403.1	25	4	7/8	*	130
40	4	1	*	140	63.469.1	40	4	1	*	140
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	3/8	*	220	63.643.1					
250	16	3/8	*	240	63.646.1					
300	20	3/8	*	250	63.647.1					
350	20	1 1/2	*	280	63.693.1					
400	20	5/8	*	290	63.724.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	3/4	*	120
					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	3/8	*	240	200	12	3/8	*	270
250	16	3/8	*	250	250	16	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	5/8	*	310	400	20	5/8	*	360

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	* MM		

50	8	7/8	*	220	63.417.1
80	8	7/8	*	230	63.418.1
100	8	1 1/8	*	280	63.549.1
150	12	1 1/8	*	360	63.562.1
200	12	1 3/8	*	440	63.666.1
250	16	1 3/8	*	490	63.674.1
300	20	1 3/8	*	560	63.669.1
350	20	1 1/2	*	640	63.716.1
400	20	1 5/8	*	690	63.754.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.86.662.1

```

```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.464.1
WELDING NECK FLANGE    1  76.62.86.664.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE        2  76.62.86.662.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.662.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1      76.62.86.662.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

```

* 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      76.83.37.121.1

```

```

* 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  76.62.52.537.1
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  76.83.37.122.1

```

```

* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE      1  77.30.91.043.1
WELDING NECK FLANGE             1  76.62.86.662.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.86.664.1

```

```

* VENT POINT          DN 20  FIG.DE  DN 50 -400
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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1

```

CLASS 91500

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 0 50 75 100 120

PRESSURE BAR GA

DN15 -400 137.5 137.5 137.1 136.3 135.3 134.0

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
- FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- 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
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	E	B	B	A		
200	C	C	C	C	E	E	E	B	B	A			
150	C	C	C	C	E	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	160
20	160
25	160
40	160
50	160
80	160
100	120
150	120
200	120
250	120
300	100
350	100
400	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 LOW TEMP. SOUR	PLANT :
CLASS NO. : 91500	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91500, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 91500, REV.B PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE															
PIPE	74.30.16	023.1	030.1	038.1	054.1	063.1	071.1	078.1	087.1	100.1	112.1	123.1	136.1	145.1	
* 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	634.1	636.1	
SPECTACLE BLIND FLANGE	76.88.35	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)	76.88.47	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	
WELDING NECK FLANGE	76.62.86	662.1	664.1	666.1	668.1	670.1	472.1	414.1	416.1	418.1	420.1	392.1	394.1	396.1	
* FITTINGS															
CAP BUTT-WELD.END	76.31.17	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	334.1	354.1	374.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	334.1	354.1	374.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	334.1	354.1	374.1	
EQUAL TEE BUTT-WELD ENDS	76.31.80	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	334.1	354.1	374.1	
* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.00.86					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RB TRUNNION NON EXT	77.00.86					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
BALL VALVE FULL BORE TRUN FLGD	77.00.83					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.83					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
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	168.1	169.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.33	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.33	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1									
* 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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.97					970.1	886.1	864.1	866.1	868.1	870.1	852.1	854.1	856.1	

	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	79.06.804.1			
25* 15		31.66.151.1	31.75.151.1	31.88.049.1	400* 80	79.06.814.1			
25* 20		31.66.161.1	31.75.161.1	31.88.059.1	400*100	79.06.534.1			
40* 15		31.66.171.1	31.75.171.1	31.88.069.1	400*150	79.06.545.1	29.45.758.1	29.60.758.1	31.88.473.1
40* 20		31.66.181.1	31.75.181.1	31.88.079.1	400*200		29.45.822.1	29.60.822.1	31.88.491.1
40* 25		31.66.191.1	31.75.191.1	31.88.089.1	400*250		31.66.540.1	31.75.540.1	31.88.513.1
50* 20		31.66.195.1	31.75.195.1	31.88.098.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		31.66.201.1	31.75.201.1	31.88.107.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		31.66.211.1	31.75.211.1	31.88.116.1					
80* 40		31.66.231.1	31.75.231.1	31.88.125.1					
80* 50	79.07.180.1	31.66.241.1	31.75.241.1	31.88.134.1					
100* 40		31.66.254.1	31.75.254.1	31.88.149.1					
100* 50	79.07.001.1	31.66.270.1	31.75.270.1	31.88.161.1					
100* 80		31.66.280.1	31.75.280.1	31.88.173.1					
150* 50	79.07.002.1								
150* 80		31.66.300.1	31.75.300.1	31.88.185.1					
150*100	79.06.670.1	31.66.309.1	31.75.309.1	31.88.191.1					
200* 50	79.07.003.1								
200* 80	79.07.016.1								
200*100	79.06.672.1	31.66.329.1	31.75.329.1	31.88.207.1					
200*150	79.06.692.1	31.66.339.1	31.75.339.1	31.88.227.1					
250* 50	79.07.004.1								
250* 80	79.07.017.1								
250*100	79.06.674.1	31.66.347.1	31.75.347.1	31.88.255.1					
250*150	79.06.694.1	31.66.359.1	31.75.359.1	31.88.273.1					
250*200	79.06.712.1	31.66.369.1	31.75.369.1	31.88.295.1					
300* 50	79.06.802.1								
300* 80	79.06.812.1								
300*100	79.06.532.1								
300*150		31.66.379.1	31.75.379.1	31.88.321.1					
300*200		31.66.393.1	31.75.393.1	31.88.341.1					
300*250		29.45.540.1	29.60.540.1	31.88.358.1					
350* 50	79.06.803.1								
350* 80	79.06.813.1								
350*100	79.06.533.1								
350*150		29.45.608.1	29.60.608.1	31.88.383.1					
350*200		31.66.429.1	31.75.429.1	31.88.402.1					
350*250		29.45.680.1	29.60.680.1	31.88.425.1					
350*300		31.66.448.1	31.75.448.1	31.88.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	821.1	116.1
20	40-400	823.1	118.1
25	40-100	825.1	120.1
	150-400	826.1	124.1
40	50-100	830.1	126.1
	150-400	831.1	128.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.642.1		230	76.83.37.121.1
813	76.80.60.644.1		255	76.83.37.122.1
1219	76.80.60.646.1		305	76.83.37.123.1
1524	76.80.60.648.1		355	76.83.37.125.1
1829	76.80.60.650.1		405	76.83.37.126.1
2134	76.80.60.652.1		455	76.83.37.127.1
2438	76.80.60.654.1			
2743	76.80.60.656.1			
3048	76.80.60.658.1			

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

BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

81.38					81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM
15	4	3/4	*	110	67.330.1	15	4	3/4	*	110
20	4	3/4	*	110	67.330.1	20	4	3/4	*	120
25	4	7/8	*	130	67.403.1	25	4	7/8	*	130
40	4	1	*	140	67.469.1	40	4	1	*	140
50	8	7/8	*	150	67.406.1					
80	8	7/8	*	150	67.406.1					
100	8	1	1/8	*	170	67.532.1				
150	12	1	1/8	*	190	67.535.1				
200	12	1	3/8	*	220	67.643.1				
250	16	1	3/8	*	240	67.646.1				
300	20	1	3/8	*	250	67.647.1				
350	20	1	1/2	*	280	67.693.1				
400	20	1	5/8	*	290	67.724.1				

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38						
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		
							15	4	3/4	*	120	67.332.1
							20	4	3/4	*	130	67.334.1
							25	4	7/8	*	140	67.404.1
							40	4	1	*	160	67.472.1
50	8	7/8	*	160	67.407.1		50	8	7/8	*	160	67.407.1
80	8	7/8	*	160	67.407.1		80	8	7/8	*	170	67.409.1
100	8	1 1/8	*	180	67.533.1		100	8	1 1/8	*	200	67.544.1
150	12	1 1/8	*	210	67.538.1		150	12	1 1/8	*	230	67.541.1
200	12	1 3/8	*	240	67.646.1		200	12	1 3/8	*	270	67.652.1
250	16	1 3/8	*	250	67.647.1		250	16	1 3/8	*	290	67.654.1
300	20	1 3/8	*	280	67.653.1		300	20	1 3/8	*	310	67.656.1
350	20	1 1/2	*	300	67.696.1		350	20	1 1/2	*	350	67.704.1
400	20	1 5/8	*	310	67.727.1		400	20	1 5/8	*	360	67.736.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM		81.38
50	8	7/8	*	220	67.417.1
80	8	7/8	*	230	67.418.1
100	8	1 1/8	*	280	67.549.1
150	12	1 1/8	*	360	67.562.1
200	12	1 3/8	*	440	67.672.1
250	16	1 3/8	*	490	67.677.1
300	20	1 3/8	*	560	67.680.1
350	20	1 1/2	*	640	67.715.1
400	20	1 5/8	*	690	67.769.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.463.1
WELDING NECK FLANGE    1  76.62.86.662.1

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```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.464.1
WELDING NECK FLANGE   1  76.62.86.664.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.86.662.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.662.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

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```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1      76.62.86.662.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

```

* 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      81.38.67.472.1
THERMOWELL STRAIGHT      L=230 MM     1      76.83.37.121.1

```

```

* 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  76.62.52.537.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                   4  81.38.67.472.1
THERMOWELL STRAIGHT      L=255 MM    1  76.83.37.122.1

```

```

* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE       1  77.30.91.043.1
WELDING NECK FLANGE              1  76.62.86.662.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE         1  76.62.86.664.1

```

```

* VENT POINT          DN 20  FIG.DE  DN 50 -400
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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1

```

CLASS 91501

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -400	137.5	137.5	137.1	136.3	135.3	134.0

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	E	B	B	A		
200	C	C	C	C	E	E	E	B	B	A			
150	C	C	C	C	E	B	B	A					
100	C	C	C	C	B	B	B	A					
80	C	C	C	B	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	160
20	160
25	160
40	160
50	160
80	160
100	120
150	120
200	120
250	120
300	100
350	100
400	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 LOW TEMP. SOUR	PLANT :	
CLASS NO. : 91501	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE															
PIPE	74.30.16	023.1	030.1	038.1	054.1	063.1	071.1	078.1	087.1	100.1	112.1	123.1	136.1	145.1	
* 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	634.1	636.1	
SPECTACLE BLIND FLANGE	76.88.35	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)	76.88.47	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	
WELDING NECK FLANGE	76.62.86	662.1	664.1	666.1	668.1	670.1	472.1	414.1	416.1	418.1	420.1	392.1	394.1	396.1	
* FITTINGS															
CAP BUTT-WELD.END	76.31.17	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	334.1	354.1	374.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	334.1	354.1	374.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	334.1	354.1	374.1	
EQUAL TEE BUTT-WELD ENDS	76.31.80	172.1	178.1	182.1	192.1	212.1	232.1	250.1	270.1	291.1	312.1	334.1	354.1	374.1	
* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.00.94					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RB TRUNNION NON EXT	77.00.94					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
BALL VALVE FULL BORE TRUN FLGD	77.00.93					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.93					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
CHECK VALVE FLANGED	77.10.44	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.58					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.54	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.54	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						
MONOFL SINGLE BLOCK BALL	77.00.97	463.1	464.1	465.1	467.1	468.1									
* 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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.97					970.1	886.1	864.1	866.1	868.1	870.1	852.1	854.1	856.1	

	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	79.06.804.1			
25* 15		31.66.151.1	31.75.151.1	31.88.049.1	400* 80	79.06.814.1			
25* 20		31.66.161.1	31.75.161.1	31.88.059.1	400*100	79.06.534.1			
40* 15		31.66.171.1	31.75.171.1	31.88.069.1	400*150	79.06.545.1	29.45.758.1	29.60.758.1	31.88.473.1
40* 20		31.66.181.1	31.75.181.1	31.88.079.1	400*200		29.45.822.1	29.60.822.1	31.88.491.1
40* 25		31.66.191.1	31.75.191.1	31.88.089.1	400*250		31.66.540.1	31.75.540.1	31.88.513.1
50* 20		31.66.195.1	31.75.195.1	31.88.098.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		31.66.201.1	31.75.201.1	31.88.107.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		31.66.211.1	31.75.211.1	31.88.116.1					
80* 40		31.66.231.1	31.75.231.1	31.88.125.1					
80* 50	79.07.180.1	31.66.241.1	31.75.241.1	31.88.134.1					
100* 40		31.66.254.1	31.75.254.1	31.88.149.1					
100* 50	79.07.001.1	31.66.270.1	31.75.270.1	31.88.161.1					
100* 80		31.66.280.1	31.75.280.1	31.88.173.1					
150* 50	79.07.002.1								
150* 80		31.66.300.1	31.75.300.1	31.88.185.1					
150*100	79.06.670.1	31.66.309.1	31.75.309.1	31.88.191.1					
200* 50	79.07.003.1								
200* 80	79.07.016.1								
200*100	79.06.672.1	31.66.329.1	31.75.329.1	31.88.207.1					
200*150	79.06.692.1	31.66.339.1	31.75.339.1	31.88.227.1					
250* 50	79.07.004.1								
250* 80	79.07.017.1								
250*100	79.06.674.1	31.66.347.1	31.75.347.1	31.88.255.1					
250*150	79.06.694.1	31.66.359.1	31.75.359.1	31.88.273.1					
250*200	79.06.712.1	31.66.369.1	31.75.369.1	31.88.295.1					
300* 50	79.06.802.1								
300* 80	79.06.812.1								
300*100	79.06.532.1								
300*150		31.66.379.1	31.75.379.1	31.88.321.1					
300*200		31.66.393.1	31.75.393.1	31.88.341.1					
300*250		29.45.540.1	29.60.540.1	31.88.358.1					
350* 50	79.06.803.1								
350* 80	79.06.813.1								
350*100	79.06.533.1								
350*150		29.45.608.1	29.60.608.1	31.88.383.1					
350*200		31.66.429.1	31.75.429.1	31.88.402.1					
350*250		29.45.680.1	29.60.680.1	31.88.425.1					
350*300		31.66.448.1	31.75.448.1	31.88.444.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	821.1	116.1
20	40-400	823.1	118.1
25	40-100	825.1	120.1
	150-400	826.1	124.1
40	50-100	830.1	126.1
	150-400	831.1	128.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.642.1		230	76.83.37.121.1
813	76.80.60.644.1		255	76.83.37.122.1
1219	76.80.60.646.1		305	76.83.37.123.1
1524	76.80.60.648.1		355	76.83.37.125.1
1829	76.80.60.650.1		405	76.83.37.126.1
2134	76.80.60.652.1		455	76.83.37.127.1
2438	76.80.60.654.1			
2743	76.80.60.656.1			
3048	76.80.60.658.1			

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

BOLTSET METER-RUN

81.38					81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM
15	4	3/4	*	110	67.330.1	15	4	3/4	*	110
20	4	3/4	*	110	67.330.1	20	4	3/4	*	120
25	4	7/8	*	130	67.403.1	25	4	7/8	*	130
40	4	1	*	140	67.469.1	40	4	1	*	140
50	8	7/8	*	150	67.406.1					
80	8	7/8	*	150	67.406.1					
100	8	1	1/8	*	170	67.532.1				
150	12	1	1/8	*	190	67.535.1				
200	12	1	3/8	*	220	67.643.1				
250	16	1	3/8	*	240	67.646.1				
300	20	1	3/8	*	250	67.647.1				
350	20	1	1/2	*	280	67.693.1				
400	20	1	5/8	*	290	67.724.1				

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

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	67.417.1
80	8	7/8	*	230	67.418.1
100	8	1 1/8	*	280	67.549.1
150	12	1 1/8	*	360	67.562.1
200	12	1 3/8	*	440	67.672.1
250	16	1 3/8	*	490	67.677.1
300	20	1 3/8	*	560	67.680.1
350	20	1 1/2	*	640	67.715.1
400	20	1 5/8	*	690	67.769.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.97.463.1
WELDING NECK FLANGE   1  76.62.86.662.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.464.1
WELDING NECK FLANGE    1  76.62.86.664.1

```

```

* DRAIN POINT          DN 20 FIG.DE   DN 50 -400
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
MONOFL SINGLE BLOCK BALL 1   77.00.97.464.1

```

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.363.1
WELDING NECK FLANGE      2  76.62.86.662.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1   85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1   77.85.47.363.1
WELDING NECK FLANGE               1   76.62.86.662.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.363.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
WELDING NECK FLANGE       1    76.62.86.662.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1

```

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* 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      81.38.67.472.1
THERMOWELL STRAIGHT      L=230 MM    1      76.83.37.121.1

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* 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  76.62.52.537.1
GASKET, SPIRAL WOUND                1  85.41.46.512.1
STUD BOLT WITH NUTS                  4  81.38.67.472.1
THERMOWELL STRAIGHT      L=255 MM    1  76.83.37.122.1

```

```

* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE      1  77.30.92.043.1
WELDING NECK FLANGE             1  76.62.86.662.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.92.044.1
WELDING NECK FLANGE         1  76.62.86.664.1

```

```

* VENT POINT          DN 20  FIG.DE  DN 50 -400
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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.92.044.1

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CLASS 91520

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 75 100 120

PRESSURE BAR GA

DN15 -400 137.5 137.5 137.3 136.7

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
 - 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
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	B	B	B	B	A	
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	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	160
20	160
25	160
40	160
50	160
80	160
100	120
150	120
200	120
250	120
300	100
350	100
400	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 SOUR	PLANT :	
CLASS NO. : 91520	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 : DECEMBER 1998

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

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* PIPE				* VALVES			
PIPE	PIPE	DN 15-350	ASTM A106-B	BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216+ENP,A105+ENP
		DN400-400	ASTM A333-6	BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	TRIM: BODY MAT,AISI 316,NYLON
* FLANGES				CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
BLFL	BLIND FLANGE	DN 15-400	ASTM A105			DN 50-400	TRIM: AISI 316(L),STELLITE 6
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A105	CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A216-WCB/WCC,A105
SBFL	SPECTACLE BLIND FLANGE	DN 15-400	ASTM A516-60	GAVF	GATE VALVE FLANGED	DN 15- 40	TRIM: AISI 316,STELLITE 6
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A516-60	GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
WNFL	WELDING NECK FLANGE	DN 15-400	ASTM A105			DN 50-150	TRIM: AISI 316(L),STELLITE 6
* FITTINGS							BODY: ASTM A216-WCB/WCC,A105
CAPB	CAP BUTT-WELD.END	DN 15-350	ASTM A234-WPB	MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	TRIM: AISI 410
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB	MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A352-LCC,A350-LF2
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB				TRIM: AISI 316
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB	VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A350-LF2
		DN400-400	ASTM A420-WPL6				TRIM: AISI 316,STELLITE 6
* REDUCING FITTINGS				* MISCELLANEOUS			
BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A105	CLBL	BLIND HUB FOR CLAMP COUPLING	DN 15-300	AISI 4140 WITH PTFE COATING
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A105	CLHB	HUB FOR CLAMP COUPLING BW END	DN 15-300	ASTM A350-LF2
BROB	BRANCH OUTLET RED. BUTT WELD	DN 80-350	ASTM A105	CLSR	SEAL RING FOR CLAMP COUPLING	DN 15-300	AISI 4140 WITH PTFE COATING
		DN400-400	ASTM A350-LF2	GKSW	GASKET, SPIRAL WOUND	DN 15-400	AISI 316(L),GRAPHITE FILLED
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB	LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A106-B
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB	MTRR	METER RUN	DN 15- 40	MONEL 400
		DN400-400	ASTM A420-WPL6	ORFS	ORIFICE FLANGE SET	DN 50-400	LJ END FLANGES: ASTM A350-LF2
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-350	ASTM A234-WPB	STBT	STUD BOLT WITH NUTS	---	ASTM A105
		DN400-400	ASTM A420-WPL6	TWGS	THERMOWELL STRAIGHT	DN 40- 40	ASTM A193-B7M/A194-2HM
							MONEL 400

PIPING COMPONENTS

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		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	345.1	393.1		
	74.30.16													145.1	
* 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	852.1	854.1	856.1	
* 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	734.1	754.1		
	76.31.17													374.1	
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	734.1	754.1		
	76.31.34													374.1	
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	734.1	754.1		
	76.31.43													374.1	
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	734.1	754.1		
	76.31.80													374.1	
* VALVES															
BALL VALVE FULL BORE TRUN FLGD	77.00.73					658.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.73					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1										
	77.10.23					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					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										
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1										
	77.30.23					208.1	160.1	162.1	164.1						
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1									
* MISCELLANEOUS															
BLIND HUB FOR CLAMP COUPLING	76.81.09	028.1	026.1	024.1	034.1	046.1	086.1	108.1	146.1	204.1	248.1	296.1			
CLAMP FOR CLAMP COUPLING	76.81.01			006.1	008.1	010.1	012.1	014.1	018.1						
HUB FOR CLAMP COUPLING BW END	76.81.13	006.1	014.1	024.1	034.1	046.1	086.1	106.1	146.1	198.1	248.1	296.1			
SEAL RING FOR CLAMP COUPLING	76.81.05	006.1	012.1	018.1	030.1	048.1	060.1	084.1	156.1	192.1	276.1	348.1			
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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.95					970.1	886.1	864.1	866.1	868.1	870.1	852.1	854.1	856.1	

	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	79.06.804.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.06.814.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.06.534.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150		29.45.758.1	29.60.758.1	31.88.473.1
40* 20		30.66.181.1	30.67.181.1	30.88.079.1	400*200		29.45.822.1	29.60.822.1	31.88.491.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250		31.66.540.1	31.75.540.1	31.88.513.1
50* 20		30.66.195.1	30.67.195.1	30.88.098.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		30.66.201.1	30.67.201.1	30.88.107.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1					
80* 40		30.66.231.1	30.67.231.1	30.88.125.1					
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	30.88.149.1					
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	79.02.802.1								
300* 80	79.02.812.1								
300*100	79.02.532.1								
300*150		30.66.379.1	30.67.379.1	30.88.321.1					
300*200		30.66.393.1	30.67.393.1	30.88.341.1					
300*250		29.47.540.1	29.62.540.1	30.88.363.1					
350* 50	79.02.803.1								
350* 80	79.02.813.1								
350*100	79.02.533.1								
350*150		29.47.608.1	29.62.608.1	30.88.383.1					
350*200		30.66.429.1	30.67.429.1	30.88.405.1					
350*250		29.47.680.1	29.62.680.1	30.88.428.1					
350*300		30.66.448.1	30.67.448.1	30.88.444.1					

		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	76.83.37.121.1
813	76.80.60.464.1		255	76.83.37.122.1
1219	76.80.60.466.1		305	76.83.37.123.1
1524	76.80.60.468.1		355	76.83.37.125.1
1829	76.80.60.470.1		405	76.83.37.126.1
2134	76.80.60.472.1		455	76.83.37.127.1
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

BOLTSET WAFER CHECK VALVE

81.38				
DN	NR	INCH	* MM	
50	8	7/8	* 220	66.417.1
80	8	7/8	* 230	66.418.1
100	8	1 1/8	* 280	66.549.1
150	12	1 1/8	* 360	66.562.1
200	12	1 3/8	* 440	66.673.1
250	16	1 3/8	* 490	66.674.1
300	20	1 3/8	* 560	86.217.1
350	20	1 1/2	* 640	86.295.1
400	20	1 5/8	* 690	86.370.1

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.463.1	
WELDING NECK FLANGE	1	76.62.79.962.1	
* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1	
WELDING NECK FLANGE	1	76.62.79.964.1	
* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -400
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.063.1	
WELDING NECK FLANGE	2	76.62.79.962.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.063.1	
WELDING NECK FLANGE	1	76.62.79.962.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.063.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.063.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.063.1	
WELDING NECK FLANGE	1	76.62.79.962.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.41.46.504.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.063.1	
* 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	76.83.37.121.1	
* 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	76.83.37.122.1	
* VENT POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.043.1	
WELDING NECK FLANGE	1	76.62.79.962.1	
* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	
WELDING NECK FLANGE	1	76.62.79.964.1	
* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	

CLASS 91521

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 75 100 120

PRESSURE BAR GA

DN15 -400 137.5 137.5 137.3 136.7

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	B	B	B	B	A	
250	C	C	C	C	E	E	E	B	B	B	A		
200	C	C	C	C	E	E	E	B	B	B	A		
150	C	C	C	C	E	E	B	B	A				
100	C	C	C	C	B	B	B	A					
80	C	C	C	B	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	160
20	160
25	160
40	160
50	160
80	160
100	120
150	120
200	120
250	120
300	100
350	100
400	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 SOUR	PLANT :	
CLASS NO. : 91521	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 91521, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-350	ASTM A106-B
		DN400-400	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-350	ASTM A234-WPB
		DN400-400	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-400	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-400	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-350	ASTM A234-WPB
		DN400-400	ASTM A420-WPL6

* 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 80-350	ASTM A105
		DN400-400	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-400	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-400	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-350	ASTM A234-WPB
		DN400-400	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* MISCELLANEOUS

CLBL	BLIND HUB FOR CLAMP COUPLING	DN 15-300	AISI 4140 WITH PTFE COATING
CLHB	HUB FOR CLAMP COUPLING BW END	DN 15-300	ASTM A350-LF2
CLSR	SEAL RING FOR CLAMP COUPLING	DN 15-300	AISI 4140 WITH PTFE COATING
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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

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ISSUE DATE : DECEMBER 1998

		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	345.1	393.1		
	74.30.16													145.1	
* 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	852.1	854.1	856.1	
* 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	734.1	754.1		
	76.31.17													374.1	
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	734.1	754.1		
	76.31.34													374.1	
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	734.1	754.1		
	76.31.43													374.1	
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	734.1	754.1		
	76.31.80													374.1	
* VALVES															
BALL VALVE FULL BORE TRUN FLGD	77.00.91					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.91					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
CHECK VALVE FLANGED	77.10.43	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.57					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.20.53	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.53	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						
MONOFL SINGLE BLOCK BALL	77.00.97	463.1	464.1	465.1	467.1	468.1									
* MISCELLANEOUS															
BLIND HUB FOR CLAMP COUPLING	76.81.09	028.1	026.1	024.1	034.1	046.1	086.1	108.1	146.1	204.1	248.1	296.1			
CLAMP FOR CLAMP COUPLING	76.81.01			006.1	008.1	010.1	012.1	014.1	018.1						
HUB FOR CLAMP COUPLING BW END	76.81.13	006.1	014.1	024.1	034.1	046.1	086.1	106.1	146.1	198.1	248.1	296.1			
SEAL RING FOR CLAMP COUPLING	76.81.05	006.1	012.1	018.1	030.1	048.1	060.1	084.1	156.1	192.1	276.1	348.1			
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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.95					970.1	886.1	864.1	866.1	868.1	870.1	852.1	854.1	856.1	

	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	79.06.804.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.06.814.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.06.534.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150		29.45.758.1	29.60.758.1	31.88.473.1
40* 20		30.66.181.1	30.67.181.1	30.88.079.1	400*200		29.45.822.1	29.60.822.1	31.88.491.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250		31.66.540.1	31.75.540.1	31.88.513.1
50* 20		30.66.195.1	30.67.195.1	30.88.098.1	400*300		31.66.477.1	31.75.477.1	31.88.534.1
50* 25		30.66.201.1	30.67.201.1	30.88.107.1	400*350		31.66.488.1	31.75.488.1	31.88.559.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1					
80* 40		30.66.231.1	30.67.231.1	30.88.125.1					
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	30.88.149.1					
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	79.02.802.1								
300* 80	79.02.812.1								
300*100	79.02.532.1								
300*150		30.66.379.1	30.67.379.1	30.88.321.1					
300*200		30.66.393.1	30.67.393.1	30.88.341.1					
300*250		29.47.540.1	29.62.540.1	30.88.363.1					
350* 50	79.02.803.1								
350* 80	79.02.813.1								
350*100	79.02.533.1								
350*150		29.47.608.1	29.62.608.1	30.88.383.1					
350*200		30.66.429.1	30.67.429.1	30.88.405.1					
350*250		29.47.680.1	29.62.680.1	30.88.428.1					
350*300		30.66.448.1	30.67.448.1	30.88.444.1					

		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	76.83.37.121.1
813	76.80.60.464.1		255	76.83.37.122.1
1219	76.80.60.466.1		305	76.83.37.123.1
1524	76.80.60.468.1		355	76.83.37.125.1
1829	76.80.60.470.1		405	76.83.37.126.1
2134	76.80.60.472.1		455	76.83.37.127.1
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

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	1/8	* 170	66.532.1					
150	12	1/8	* 190	66.535.1					
200	12	3/8	* 220	66.643.1					
250	16	3/8	* 240	66.646.1					
300	20	3/8	* 250	66.647.1					
350	20	1/2	* 280	66.693.1					
400	20	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
					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	3/8	*	240	200	12	3/8	*	270
250	16	3/8	*	250	250	16	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	5/8	*	310	400	20	5/8	*	360

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	
50	8	7/8	*	220	66.417.1
80	8	7/8	*	230	66.418.1
100	8	1 1/8	*	280	66.549.1
150	12	1 1/8	*	360	66.562.1
200	12	1 3/8	*	440	66.673.1
250	16	1 3/8	*	490	66.674.1
300	20	1 3/8	*	560	86.217.1
350	20	1 1/2	*	640	86.295.1
400	20	1 5/8	*	690	86.370.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.97.463.1
WELDING NECK FLANGE  1  76.62.79.962.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.464.1
WELDING NECK FLANGE    1  76.62.79.964.1

```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.00.97.464.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.363.1
WELDING NECK FLANGE       2  76.62.79.962.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB  DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1      77.85.47.363.1
WELDING NECK FLANGE      1      76.62.79.962.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.363.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
WELDING NECK FLANGE       1    76.62.79.962.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1

```

```

* 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      76.83.37.121.1

```

```

* 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               1   76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                      DN 15  FIG.DF  DN 15 - 25
Branch:N (rN=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
MONOFL SINGLE BLOCK NEEDLE       1  77.30,92.043.1
WELDING NECK FLANGE              1  76.62,79.962.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.92.044.1
WELDING NECK FLANGE        1  76.62.79.964.1

```

```

* VENT POINT                DN 20  FIG.DE  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
MONOFL SINGLE BLOCK NEEDLE 1    77.30/92.044.1

```

CLASS 93410

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-20	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -200	148.9	148.9	144.3	135.0	126.7	122.2

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE 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.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	B	B A
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	40S
40	40S
50	80S
80	80S
100	80S
150	120
200	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.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 93410	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 93410, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316 (L), NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316 (L), NYLON
CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L), STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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 A312-TP316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 93410, REV.B PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	060.1	068.1	076.1	087.1	099.1
* FLANGES										
BLIND FLANGE	76.65.10	500.1	501.1	502.1	503.1	504.1	489.1	490.1	491.1	492.1
SPECTACLE BLIND FLANGE	76.88.10	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	558.1	562.1	566.1	568.1	570.1	572.1	574.1	576.1	578.1
WELDING NECK FLANGE	76.65.80	582.1	584.1	586.1	588.1	609.1	572.1	574.1	580.1	579.1
* FITTINGS										
CAP BUTT-WELD.END	76.33.19	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	786.1	796.1	806.1	826.1	838.1	858.1	878.1	898.1	912.1
* VALVES										
BALL VALVE FULL BORE TRUN FLGD	77.03.74					708.1	660.1	662.1	664.1	665.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74					208.1	160.1	162.1	164.1	165.1
CHECK VALVE FLANGED	77.13.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					208.1	160.1	162.1	164.1	165.1
GATE VALVE FLANGED	77.23.03	203.1	204.1	205.1	207.1					
GLOBE VALVE FLANGED	77.33.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1		
MONOFL SINGLE BLOCK BALL	77.03.90	163.1	164.1	165.1	167.1	168.1				
* 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
METER RUN	76.64.96	082.1	084.1	086.1	088.1					
ORIFICE FLANGE SET	76.65.92					570.1	572.1	574.1	580.1	579.1

	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	79.70.488.1				
150* 80	79.70.512.1	33.70.751.1	33.72.751.1	33.89.389.1	
150*100	79.70.534.1	33.70.761.1	33.72.761.1	33.89.397.1	
200* 50	79.70.490.1				
200* 80	79.70.514.1				
200*100	79.70.536.1	33.70.770.1	33.72.770.1	33.89.405.1	
200*150		33.70.784.1	33.72.784.1	33.89.415.1	

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
	200-200	122.1	452.1
20	40- 80	123.1	453.1
	100-200	124.1	454.1
25	40- 40	125.1	455.1
	50- 50	126.1	456.1
	80-100	127.1	457.1
	150-200	128.1	458.1
40	50- 50	130.1	459.1
	80- 80	131.1	460.1
	100-100	132.1	461.1
	150-200	133.1	462.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.61.502.1		230	76.83.37.121.1
813	76.80.61.504.1		255	76.83.37.122.1
1219	76.80.61.506.1		305	76.83.37.123.1
1524	76.80.61.508.1		355	76.83.37.125.1
1829	76.80.61.510.1		405	76.83.37.126.1
2134	76.80.61.512.1		455	76.83.37.127.1
2438	76.80.61.514.1			
2743	76.80.61.516.1			
3048	76.80.61.518.1			

BOLTSET FLANGED JOINTS

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
20	4	3/4	*	110	61.330.1	20	4	3/4	*	120
25	4	7/8	*	130	61.403.1	25	4	7/8	*	130
40	4	1	*	140	61.469.1	40	4	1	*	140
50	8	7/8	*	150	61.406.1					
80	8	7/8	*	150	61.406.1					
100	8	1	1/8	*	170					
150	12	1	1/8	*	190					
200	12	1	3/8	*	220					

BOLTSET ORIFICE FLANGES

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

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	61.417.1
80	8	7/8	* 230	61.418.1
100	8	1 1/8	* 280	61.549.1
150	12	1 1/8	* 360	61.562.1
200	12	3/8	* 440	61.669.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.163.1
WELDING NECK FLANGE    1  76.65.80.582.1

```

```
* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING.COM.)
BLIND FLANGE           1  76.65.10.501.1
GASKET, SPIRAL WOUND   2  85.41.46.506.1
MONOFL SINGLE BLOCK BALL 1  77.03.90.164.1
WELDING NECK FLANGE    1  76.65.80.584.1
```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.03.90.164.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -200
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.563.1
WELDING NECK FLANGE       2  76.65.80.582.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB  DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1      77.85.47.563.1
WELDING NECK FLANGE      1      76.65.80.582.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.563.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.563.1
WELDING NECK FLANGE       1      76.65.80.582.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1

```

```

* 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      76.83.37.121.1

```

```

* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -200
Branch:S (N=br.tab,S=BNIF,N=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                   1   76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.93.043.1
WELDING NECK FLANGE       1  76.65.80.582.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.93.044.1
WELDING NECK FLANGE        1  76.65.00.584.1

```

* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.044.1	

CLASS 93420

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-20	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -200	137.5	137.5	135.4	131.3	126.7	122.2

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - 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
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	B	B A
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	40S
40	40S
50	80S
80	80S
100	80S
150	120
200	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.

STAINLESS STEEL AISI 316, SOUR	PLANT :	
CLASS NO. : 93420	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), NYLON
CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316(L), STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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 A312-TP316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWGS	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	060.1	068.1	076.1	087.1	099.1
* FLANGES										
BLIND FLANGE	76.65.10	500.1	501.1	502.1	503.1	504.1	489.1	490.1	491.1	492.1
SPECTACLE BLIND FLANGE	76.88.10	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	558.1	562.1	566.1	568.1	570.1	572.1	574.1	576.1	578.1
WELDING NECK FLANGE	76.65.80	582.1	584.1	586.1	588.1	609.1	572.1	574.1	580.1	579.1
* FITTINGS										
CAP BUTT-WELD.END	76.33.19	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	786.1	796.1	806.1	826.1	838.1	858.1	878.1	898.1	912.1
* VALVES										
BALL VALVE FULL BORE TRUN FLGD	77.03.74					708.1	660.1	662.1	664.1	665.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74					208.1	160.1	162.1	164.1	165.1
CHECK VALVE FLANGED	77.13.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					208.1	160.1	162.1	164.1	165.1
GATE VALVE FLANGED	77.23.03	203.1	204.1	205.1	207.1					
GLOBE VALVE FLANGED	77.33.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1		
MONOFL SINGLE BLOCK BALL	77.03.90	163.1	164.1	165.1	167.1	168.1				
* 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
METER RUN	76.64.96	082.1	084.1	086.1	088.1					
ORIFICE FLANGE SET	76.65.92					570.1	572.1	574.1	580.1	579.1

	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	79.70.488.1			
150* 80	79.70.512.1	33.70.751.1	33.72.751.1	33.89.389.1
150*100	79.70.534.1	33.70.761.1	33.72.761.1	33.89.397.1
200* 50	79.70.490.1			
200* 80	79.70.514.1			
200*100	79.70.536.1	33.70.770.1	33.72.770.1	33.89.405.1
200*150		33.70.784.1	33.72.784.1	33.89.415.1

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
	200-200	122.1	452.1
20	40- 80	123.1	453.1
	100-200	124.1	454.1
25	40- 40	125.1	455.1
	50- 50	126.1	456.1
	80-100	127.1	457.1
	150-200	128.1	458.1
40	50- 50	130.1	459.1
	80- 80	131.1	460.1
	100-100	132.1	461.1
	150-200	133.1	462.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.61.502.1		230	76.83.37.121.1
813	76.80.61.504.1		255	76.83.37.122.1
1219	76.80.61.506.1		305	76.83.37.123.1
1524	76.80.61.508.1		355	76.83.37.125.1
1829	76.80.61.510.1		405	76.83.37.126.1
2134	76.80.61.512.1		455	76.83.37.127.1
2438	76.80.61.514.1			
2743	76.80.61.516.1			
3048	76.80.61.518.1			

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.563.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.563.1
WELDING NECK FLANGE       1      76.65.80.582.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1

```

```

* 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  76.83.37.121.1

```

```
* 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   81.38.66.472.1
THERMOWELL STRAIGHT                   1   76.83.37.122.1
                                L=255 MM
```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.93.043.1
WELDING NECK FLANGE        1  76.65.80.582.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.93.044.1
WELDING NECK FLANGE         1  76.65.80.584.1

```

* VENT POINT	DN 20	FIG.DE	DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,:=N/A)	1	76.65	10.501.1
BLIND FLANGE	1	76.65	10.501.1
GASKET, SPIRAL WOUND	2	85.41	46.506.1
MONOFL SINGLE BLOCK NEEDLE	1	77.33	93.044.1

CLASS 93430

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS							
	-20	0	50	75	100	120	150	200

	PRESSURE BAR GA							
DN15 -200	148.9	148.9	144.3	135.0	126.7	122.2	115.6	106.9

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	B	B A
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	40S
40	40S
50	80S
80	80S
100	80S
150	120
200	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.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 93430	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-200	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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	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 15-100	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-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A312-TP316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	060.1	068.1	076.1	087.1	099.1
* FLANGES										
BLIND FLANGE	76.65.10	500.1	501.1	502.1	503.1	504.1	489.1	490.1	491.1	492.1
SPECTACLE BLIND FLANGE	76.88.10	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	558.1	562.1	566.1	568.1	570.1	572.1	574.1	576.1	578.1
WELDING NECK FLANGE	76.65.80	582.1	584.1	586.1	588.1	609.1	572.1	574.1	580.1	579.1
* FITTINGS										
CAP BUTT-WELD.END	76.33.19	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	786.1	796.1	806.1	826.1	838.1	858.1	878.1	898.1	912.1
* VALVES										
CHECK VALVE FLANGED	77.13.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					208.1	160.1	162.1	164.1	165.1
GATE VALVE FLANGED	77.23.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1	165.1
GLOBE VALVE FLANGED	77.33.03	203.1	204.1	205.1	207.1	208.1	160.1	162.1		
* 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
METER RUN	76.64.96	082.1	084.1	086.1	088.1					
ORIFICE FLANGE SET	76.65.92					570.1	572.1	574.1	580.1	579.1

	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	79.70.488.1			
150* 80	79.70.512.1	33.70.751.1	33.72.751.1	33.89.389.1
150*100	79.70.534.1	33.70.761.1	33.72.761.1	33.89.397.1
200* 50	79.70.490.1			
200* 80	79.70.514.1			
200*100	79.70.536.1	33.70.770.1	33.72.770.1	33.89.405.1
200*150		33.70.784.1	33.72.784.1	33.89.415.1

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
	200-200	122.1	452.1
20	40- 80	123.1	453.1
	100-200	124.1	454.1
25	40- 40	125.1	455.1
	50- 50	126.1	456.1
	80-100	127.1	457.1
	150-200	128.1	458.1
40	50- 50	130.1	459.1
	80- 80	131.1	460.1
	100-100	132.1	461.1
	150-200	133.1	462.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
356	76.80.61.502.1		230	76.83.37.121.1
813	76.80.61.504.1		255	76.83.37.122.1
1219	76.80.61.506.1		305	76.83.37.123.1
1524	76.80.61.508.1		355	76.83.37.125.1
1829	76.80.61.510.1		405	76.83.37.126.1
2134	76.80.61.512.1		455	76.83.37.127.1
2438	76.80.61.514.1			
2743	76.80.61.516.1			
3048	76.80.61.518.1			

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* 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
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* 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   76.83.37.121.1

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* 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   76.83.37.122.1

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* VENT POINT                      DN 15  FIG.11  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPPING 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

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* 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

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* 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

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CLASS 93450

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS						
-100	0	50	75	100	120	

PRESSURE BAR GA						
DN15 -200	148.9	148.9	144.3	135.0	126.7	122.2

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	B	B A
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	40S
40	40S
50	80S
80	80S
100	80S
150	120
200	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.

STAINLESS STEEL LOW TEMP.	PLANT :	
CLASS NO. : 93450	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 : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L
PNPP	PIPE NIPPLE 50MM	---	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
CHVF	CHECK VALVE FLANGED	DN 50-200	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316

* 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 A312-TP316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWSG	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	060.1	068.1	076.1	087.1	099.1
* FLANGES										
BLIND FLANGE	76.65.10	500.1	501.1	502.1	503.1	504.1	489.1	490.1	491.1	492.1
SPECTACLE BLIND FLANGE	76.88.10	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	558.1	562.1	566.1	568.1	570.1	572.1	574.1	576.1	578.1
WELDING NECK FLANGE	76.65.80	582.1	584.1	586.1	588.1	609.1	572.1	574.1	580.1	579.1
* FITTINGS										
CAP BUTT-WELD.END	76.33.19	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	786.1	796.1	806.1	826.1	838.1	858.1	878.1	898.1	912.1
* VALVES										
BALL VALVE FULL BORE TRUN FLGD	77.03.73					708.1	660.1	662.1	664.1	665.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73					208.1	160.1	162.1	164.1	165.1
CHECK VALVE FLANGED	77.13.19					208.1	160.1	162.1	164.1	165.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					208.1	160.1	162.1	164.1	165.1
GATE VALVE FLANGED	77.23.05	203.1	204.1	205.1	207.1					
GLOBE VALVE FLANGED	77.33.05	203.1	204.1	205.1	207.1	208.1	160.1	162.1		
MONOFL SINGLE BLOCK BALL	77.03.90	063.1	064.1	065.1	067.1	068.1				
* 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
METER RUN	76.64.96	032.1	034.1	036.1	038.1					
ORIFICE FLANGE SET	76.65.92					570.1	572.1	574.1	580.1	579.1

	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	79.70.488.1			
150* 80	79.70.512.1	33.70.751.1	33.72.751.1	33.89.389.1
150*100	79.70.534.1	33.70.761.1	33.72.761.1	33.89.397.1
200* 50	79.70.490.1			
200* 80	79.70.514.1			
200*100	79.70.536.1	33.70.770.1	33.72.770.1	33.89.405.1
200*150		33.70.784.1	33.72.784.1	33.89.415.1

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
	200-200	122.1	452.1
20	40- 80	123.1	453.1
	100-200	124.1	454.1
25	40- 40	125.1	455.1
	50- 50	126.1	456.1
	80-100	127.1	457.1
	150-200	128.1	458.1
40	50- 50	130.1	459.1
	80- 80	131.1	460.1
	100-100	132.1	461.1
	150-200	133.1	462.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.61.502.1		230	76.83.37.121.1
813	76.80.61.504.1		255	76.83.37.122.1
1219	76.80.61.506.1		305	76.83.37.123.1
1524	76.80.61.508.1		355	76.83.37.125.1
1829	76.80.61.510.1		405	76.83.37.126.1
2134	76.80.61.512.1		455	76.83.37.127.1
2438	76.80.61.514.1			
2743	76.80.61.516.1			
3048	76.80.61.518.1			

BOLTSET FLANGED JOINTS

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						
150	12	1	1/8	*	190						
200	12	1	3/8	*	220						

BOLTSET ORIFICE FLANGES

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	*	100	8	1	1/8	*
150	12	1	1/8	*	150	12	1	1/8	*
200	12	1	3/8	*	200	12	1	3/8	*

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	63.417.1
80	8	7/8	* 230	63.418.1
100	8	1 1/8	* 280	63.549.1
150	12	1 1/8	* 360	63.562.1
200	12	3/8	* 440	63.666.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.063.1
WELDING NECK FLANGE    1  76.65.80.582.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.064.1
WELDING NECK FLANGE    1  76.65.80.584.1

```

* DRAIN POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.064.1	

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -200
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.463.1
WELDING NECK FLANGE       2  76.65.80.582.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.463.1
WELDING NECK FLANGE       1    76.65.80.582.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.463.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.463.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.463.1
WELDING NECK FLANGE        1  76.65.80.582.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.463.1

```

```

* 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      76.65.60.787.1
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      76.83.37.121.1

```

```

* 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   76.65.60.787.1
GASKET, SPIRAL WOUND                 1   85.41.46.512.1
STUD BOLT WITH NUTS                  4   81.38.63.472.1
THERMOWELL STRAIGHT                  1   76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.92.043.1
WELDING NECK FLANGE        1  76.65.80.582.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.92.044.1
WELDING NECK FLANGE         1  76.65.80.584.1

```

* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.92.044.1	

CLASS 93460

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-73 0 50 75 100 120

PRESSURE BAR GA

DN15 -200 137.5 137.5 135.4 131.3 126.7 122.2

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	15	20	25	40	50	80	100	150
200	C	C	C	C	E	E	B	B A
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	40S
40	40S
50	80S
80	80S
100	80S
150	120
200	120

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.

STAINLESS STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 93460	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 : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 93460, REV.B PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
CHVF	CHECK VALVE FLANGED	DN 50-200	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316

* 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 A312-TP316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWGS	THERMOWELL STRAIGHT	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 93460, REV.B PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	018.1	026.1	034.1	050.1	060.1	068.1	076.1	087.1	099.1
* FLANGES										
BLIND FLANGE	76.65.10	500.1	501.1	502.1	503.1	504.1	489.1	490.1	491.1	492.1
SPECTACLE BLIND FLANGE	76.88.10	458.1	462.1	466.1	468.1	470.1	472.1	474.1	476.1	478.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	558.1	562.1	566.1	568.1	570.1	572.1	574.1	576.1	578.1
WELDING NECK FLANGE	76.65.80	582.1	584.1	586.1	588.1	609.1	572.1	574.1	580.1	579.1
* FITTINGS										
CAP BUTT-WELD.END	76.33.19	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	286.1	296.1	306.1	326.1	338.1	358.1	378.1	398.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	786.1	796.1	806.1	826.1	838.1	858.1	878.1	898.1	912.1
* VALVES										
BALL VALVE FULL BORE TRUN FLGD	77.03.73					708.1	660.1	662.1	664.1	665.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73					208.1	160.1	162.1	164.1	165.1
CHECK VALVE FLANGED	77.13.19					208.1	160.1	162.1	164.1	165.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					208.1	160.1	162.1	164.1	165.1
GATE VALVE FLANGED	77.23.05	203.1	204.1	205.1	207.1					
GLOBE VALVE FLANGED	77.33.05	203.1	204.1	205.1	207.1	208.1	160.1	162.1		
MONOFL SINGLE BLOCK BALL	77.03.90	163.1	164.1	165.1	167.1	168.1				
* 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
METER RUN	76.64.96	032.1	034.1	036.1	038.1					
ORIFICE FLANGE SET	76.65.92					570.1	572.1	574.1	580.1	579.1

	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	79.70.488.1			
150* 80	79.70.512.1	33.70.751.1	33.72.751.1	33.89.389.1
150*100	79.70.534.1	33.70.761.1	33.72.761.1	33.89.397.1
200* 50	79.70.490.1			
200* 80	79.70.514.1			
200*100	79.70.536.1	33.70.770.1	33.72.770.1	33.89.405.1
200*150		33.70.784.1	33.72.784.1	33.89.415.1

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
	200-200	122.1	452.1
20	40- 80	123.1	453.1
	100-200	124.1	454.1
25	40- 40	125.1	455.1
	50- 50	126.1	456.1
	80-100	127.1	457.1
	150-200	128.1	458.1
40	50- 50	130.1	459.1
	80- 80	131.1	460.1
	100-100	132.1	461.1
	150-200	133.1	462.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.61.502.1		230	76.83.37.121.1
813	76.80.61.504.1		255	76.83.37.122.1
1219	76.80.61.506.1		305	76.83.37.123.1
1524	76.80.61.508.1		355	76.83.37.125.1
1829	76.80.61.510.1		405	76.83.37.126.1
2134	76.80.61.512.1		455	76.83.37.127.1
2438	76.80.61.514.1			
2743	76.80.61.516.1			
3048	76.80.61.518.1			

BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

					81.38						81.38
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
15	4	3/4	*	110	67.330.1	15	4	3/4	*	110	67.330.1
20	4	3/4	*	110	67.330.1	20	4	3/4	*	120	67.332.1
25	4	7/8	*	130	67.403.1	25	4	7/8	*	130	67.403.1
40	4	1	*	140	67.469.1	40	4	1	*	140	67.469.1
50	8	7/8	*	150	67.406.1						
80	8	7/8	*	150	67.406.1						
100	8	1/8	*	170	67.532.1						
150	12	1/8	*	190	67.535.1						
200	12	3/8	*	220	67.643.1						

BOLTSET SPECTACLE/SPACER

					81.38						81.38	
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		
							15	4	3/4	*	120	67.332.1
							20	4	3/4	*	130	67.334.1
							25	4	7/8	*	140	67.404.1
							40	4	1	*	160	67.472.1
50	8	7/8	*	160	67.407.1		50	8	7/8	*	160	67.407.1
80	8	7/8	*	160	67.407.1		80	8	7/8	*	170	67.409.1
100	8	1 1/8	*	180	67.533.1	100	8	1 1/8	*	200	67.544.1	
150	12	1 1/8	*	210	67.538.1	150	12	1 1/8	*	230	67.541.1	
200	12	3/8	*	240	67.646.1	200	12	3/8	*	270	67.652.1	

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	67.417.1
80	8	7/8	*	230	67.418.1
100	8	1	1/8	*	280
150	12	1	1/8	*	360
200	12	1	3/8	*	440

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.163.1	
WELDING NECK FLANGE	1	76.65.80.582.1	

* DRAIN POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.164.1	
WELDING NECK FLANGE	1	76.65.80.584.1	

```

* DRAIN POINT DN 20 FIG.DE 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
MONOFL SINGLE BLOCK BALL 1 77.03.90.164.1

```

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -200
Branch:  (:N=br.tab;S=BNIF;:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.563.1
WELDING NECK FLANGE       2  76.65.80.582.1
```

```
* PI ON PIPING CL COUP   DN 15   FIG.CB   DN 15 - 40
Branch:N (:N=br.tab;S=BNIF;:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1   85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1
WELDING NECK FLANGE       1  76.65.80.582.1
```

```

* PI ON PIPING CL COUP      DN 15  FIG.CA      DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.563.1

```

```

* METERRUN INSTR. CONN   DN 15   FIG.AA   DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2   85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.563.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD      1  77.85.47.563.1
WELDING NECK FLANGE       1  76.65.80.582.1

```

```
* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1  77.85.47.563.1
```

```

* 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  76.65.60.787.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                  4  81.38.67.472.1
THERMOWELL STRAIGHT                  1  76.83.37.121.1
                                L=230 MM

```

```

* TEMPERATURE INSTR.C.   DN 40  FIG.BB  DN150 -200
Branch:S (:N=br,tab,:S=BNF,: =N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE      1  76.65.60.787.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                  4  81.38.67.472.1
THERMOWELL STRAIGHT                  1  76.83.37.122.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1   77.33.93.043.1
WELDING NECK FLANGE         1   76.65.80.582.1

```

* VENT POINT	DN 20	FIG.DF	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.93.044.1	
WELDING NECK FLANGE	1	76.65.80.584.1	

```

* VENT POINT                DN 20 FIG.DE    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
MONOFL SINGLE BLOCK NEEDLE 1    77.33.93.044.1

```

CLASS 93831

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 75 100 120

PRESSURE BAR GA

DN15 -600 155.1 155.1 154.5 152.9

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
- FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST

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	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	B	B	B	B	B	B	A		25	40S
400	C	C	C	C	E	E	E	E	B	B	B	B	B	A			40	40S
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	40S
300	C	C	C	C	E	E	E	E	B	B	B	B	A				80	40S
250	C	C	C	C	E	E	E	E	B	B	B	A					100	40S
200	C	C	C	C	E	E	E	B	B	B	A						150	40S
150	C	C	C	C	E	B	B	B	A								200	80S
100	C	C	C	C	B	B	B	A									250	80S
80	C	C	C	B	B	B	A										300	60
50	C	B	B	B	B	A											350	60
40	B	B	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.

DUPLEX, UNS S31803	PLANT :	
CLASS NO. : 93831	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 93831, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN250-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-600	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-600	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57										170.1	187.1	204.1	221.1	239.1	253.1	269.1
PIPE	74.36.58	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1				221.1	239.1	253.1	269.1
* FLANGES																	
BLIND FLANGE	76.66.01	152.1	154.1	156.1	158.1	160.1	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	76.88.24	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	148.1	150.1	152.1
SPADE BLIND	76.88.41	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	148.1	150.1	152.1
SPACER RING TYPE (ASME FLANGE)	76.88.23	372.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1	388.1	390.1	392.1	394.1	396.1	398.1	400.1	402.1
WELDING NECK FLANGE	76.66.29	652.1	654.1	656.1	658.1	660.1	662.1	664.1	666.1	702.1	704.1	640.1	642.1	714.1	716.1	718.1	720.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	221.1	239.1	253.1	269.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	221.1	239.1	253.1	269.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	221.1	239.1	253.1	269.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	221.1	239.1	253.1	269.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	670.1	671.1	673.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
CHECK VALVE FLANGED	77.13.41	203.1	204.1	205.1	207.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
GATE VALVE FLANGED	77.23.41	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.33.41	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1								
MONOFL SINGLE BLOCK BALL	77.03.92	463.1	464.1	465.1	467.1	468.1											
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.43.58	204.1	206.1	208.1	212.1	214.1	168.1	170.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	192.1
METER RUN	76.65.96	652.1	654.1	656.1	658.1												
ORIFICE FLANGE SET	76.66.90					636.1	638.1	640.1	642.1	668.1	670.1	845.1	846.1	652.1	653.1	654.1	655.1

BROB				BROB				BNIF		BNIP	
76.				76.				76.80.35		76.80.34	
RUN* BR								BRANCH	RUN-PIPE		
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.49.457.1		15	40-150	321.1	241.1
25* 15		36.43.021.1	36.58.021.1	36.83.021.1	400* 80	78.49.468.1			200-600	322.1	242.1
25* 20		36.43.037.1	36.58.037.1	36.83.037.1	400*100	78.49.478.1		20	40- 80	323.1	243.1
40* 15		36.43.053.1	36.58.053.1	36.83.053.1	400*150		36.83.625.1		100-600	324.1	244.1
40* 20		36.43.071.1	36.58.071.1	36.83.071.1	400*200		36.83.642.1	25	40- 40	325.1	305.1
40* 25		36.43.087.1	36.58.087.1	36.83.087.1	400*250		36.83.661.1		50- 50	326.1	306.1
50* 20		36.43.103.1	36.58.103.1	36.83.103.1	400*300		36.83.676.1		80-100	327.1	307.1
50* 25		36.43.121.1	36.58.121.1	36.83.121.1	400*350		36.83.694.1		150-600	328.1	308.1
50* 40		36.43.137.1	36.58.137.1	36.83.137.1	450* 50	78.49.458.1		40	50- 50	330.1	309.1
80* 40		36.43.153.1	36.58.153.1	36.83.153.1	450* 80	78.49.469.1			80- 80	331.1	310.1
80* 50		36.43.171.1	36.58.171.1	36.83.171.1	450*100	78.49.479.1			100-100	332.1	311.1
100* 40		36.43.187.1	36.58.187.1	36.83.187.1	450*150	78.49.488.1			150-300	333.1	312.1
100* 50		36.43.206.1	36.58.206.1	36.83.206.1	450*200		36.83.711.1		350-600	334.1	313.1
100* 80		36.43.225.1	36.58.225.1	36.83.225.1	450*250		36.83.727.1				
150* 50	78.49.632.1				450*300		36.43.744.1				
150* 80		36.43.244.1	36.58.244.1	36.83.244.1	450*350		36.43.759.1				
150*100		36.43.261.1	36.58.261.1	36.83.261.1	450*400		36.43.771.1				
200* 50	78.50.186.1				500* 50	78.49.459.1					
200* 80	78.50.208.1				500* 80	78.49.470.1					
200*100		36.43.290.1	36.58.288.1	36.83.288.1	500*100	78.49.480.1					
200*150		36.43.312.1	36.58.312.1	36.83.312.1	500*150	78.49.489.1					
250* 50	78.50.188.1				500*200	78.50.837.1					
250* 80	78.50.210.1				500*250		36.83.813.1				
250*100	78.50.224.1				500*300		36.83.829.1				
250*150		36.43.360.1	36.58.360.1	36.83.366.1	500*350		36.43.828.1		36.58.828.1	36.83.846.1	
250*200		36.43.380.1	36.58.380.1	36.83.380.1	500*400		36.43.844.1		36.58.844.1	36.83.856.1	
300* 50	78.49.100.1				500*450		36.43.856.1		36.58.856.1	36.83.873.1	
300* 80	78.49.110.1				600* 50	78.49.460.1		356	76.80.62.462.1	230	76.83.36.251.1
300*100	78.49.120.1				600* 80	78.49.471.1		813	76.80.62.464.1	255	76.83.36.252.1
300*150		36.43.424.1	36.58.424.1	36.83.424.1	600*100	78.49.481.1		1219	76.80.62.466.1	305	76.83.36.253.1
300*200		36.43.458.1	36.58.458.1	36.83.458.1	600*150	78.49.490.1		1524	76.80.62.468.1	355	76.83.36.255.1
300*250		36.43.491.1	36.58.491.1	36.83.491.1	600*200	78.50.838.1		1829	76.80.62.470.1	405	76.83.36.256.1
350* 50	78.49.101.1				600*250	78.50.845.1		2134	76.80.62.472.1	455	76.83.36.257.1
350* 80	78.49.111.1				600*300		36.83.916.1	2438	76.80.62.474.1		
350*100	78.49.121.1				600*350		36.83.935.1	2743	76.80.62.476.1		
350*150		36.43.519.1	36.58.519.1	36.83.519.1	600*400		36.83.947.1	3048	76.80.62.478.1		
350*200		36.43.548.1	36.58.548.1	36.83.549.1	600*450		36.43.967.1				
350*250		36.43.582.1	36.58.582.1	36.83.582.1	600*500		36.43.987.1				
350*300		36.43.600.1	36.58.600.1	36.83.600.1							

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
20	4	3/4	*	110	61.330.1	20	4	3/4	*	120
25	4	7/8	*	130	61.403.1	25	4	7/8	*	130
40	4	1	*	140	61.469.1	40	4	1	*	140
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				
450	20	1	7/8	*	330	61.786.1				
500	20	2		*	410	61.825.1				
600	20	2	1/2	*	520	83.703.1				

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	1/8	*	180	61.533.1		100	8	1/8	*	200	61.525.1
150	12	1/8	*	210	61.538.1		150	12	1/8	*	230	61.541.1
200	12	3/8	*	240	61.646.1		200	12	3/8	*	270	61.641.1
250	16	3/8	*	250	61.647.1		250	16	3/8	*	290	61.654.1
300	20	3/8	*	280	61.652.1		300	20	3/8	*	310	61.656.1
350	20	1/2	*	300	61.696.1		350	20	1/2	*	350	61.704.1
400	20	5/8	*	310	61.727.1		400	20	5/8	*	360	61.736.1
450	20	7/8	*	350	61.789.1		450	20	7/8	*	420	61.802.1
500	20	2	*	440	61.829.1		500	20	2	*	500	83.561.1
600	20	2 1/2	*	540	83.705.1		600	20	2 1/2	*	620	83.713.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	7/8	* 220	61.417.1
80	8	7/8	* 230	61.418.1
100	8	1/8	* 280	61.549.1
150	12	1/8	* 360	61.562.1
200	12	3/8	* 440	61.669.1
250	16	3/8	* 490	61.674.1
300	20	3/8	* 560	83.217.1
350	20	1/2	* 640	83.295.1
400	20	5/8	* 690	83.370.1
450	20	7/8	* 780	83.519.1
500	20	2	* 860	83.595.1

ASSEMBLIES

```

* DRAIN POINT                      DN 15  FIG.DF  DN 15 - 25
Branch:N (N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                      1  76.66.01.152.1
GASKET, SPIRAL WOUND              2  85.43.58.204.1
MONOFL SINGLE BLOCK BALL          1  77.03.92.463.1
WELDING NECK FLANGE              1  76.66.29.652.1

```

```

* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE          1  76.66.01.154.1
GASKET, SPIRAL WOUND  2  85.43.58.206.1
MONOFL SINGLE BLOCK BALL  1  77.03.92.464.1
WELDING NECK FLANGE  1  76.66.29.654.1

```

```

* DRAIN POINT          DN 20 FIG.DE   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE          1   76.66.01.154.1
GASKET, SPIRAL WOUND  2   85.43.58.206.1
MONOFL SINGLE BLOCK BALL 1  77.03.92.464.1

```

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* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab;:S=BNIF, :N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  2    77.85.47.863.1
WELDING NECK FLANGE        2    76.66.29.652.1

```

```

* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD      1    77.85.47.863.1
WELDING NECK FLANGE        1    76.66.29.652.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.863.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 1  77.85.47.863.1
WELDING NECK FLANGE       1      76.66.29.652.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1

```

```

* 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  76.65.61.018.1
GASKET, SPIRAL WOUND                 1  85.43.58.212.1
STUD BOLT WITH NUTS                  4  81.38.61.472.1
THERMOWELL STRAIGHT L=230 MM         1  76.83.36.251.1

```

```

* 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   76.65.61.018.1
GASKET, SPIRAL WOUND                 1   85.43.58.212.1
STUD BOLT WITH NUTS                  4   81.38.61.472.1
THERMOWELL STRAIGHT                  1   76.83.36.252.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.152.1
GASKET, SPIRAL WOUND       2  85.43.58.204.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.043.1
WELDING NECK FLANGE       1  76.66.29.652.1

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```

* VENT POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
BLIND FLANGE          1   76.66.01.154.1
GASKET, SPIRAL WOUND  2   85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.044.1
WELDING NECK FLANGE  1   76.66.29.654.1

```

```

* VENT POINT                DN 20  FIG.DE  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.154.1
GASKET, SPIRAL WOUND        2  85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.044.1

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CLASS 93832

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 120

PRESSURE BAR GA
DN15 -600 137.5 137.5

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	B	B	B	B	B	B	A		25	40S
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	40S
350	C	C	C	C	E	E	E	B	B	B	B	A					50	40S
300	C	C	C	C	E	E	E	B	B	B	B						80	40S
250	C	C	C	C	E	E	E	B	B	B	A						100	40S
200	C	C	C	C	E	E	B	B	B	A							150	40S
150	C	C	C	C	E	B	B	A									200	80S
100	C	C	C	C	B	B	B	A									250	80S
80	C	C	C	B	B	B	A										300	60
50	C	B	B	B	B	A											350	60
40	B	B	B	A													400	60
25	B	B	A														450	60
20	B	A															500	60
15	A																600	60

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.

DUPLEX, UNS S31803, SOUR	PLANT :	
CLASS NO. : 93832	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 93832, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN250-600	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-200	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-600	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-600	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-600	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-600	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-600	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-600	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-600	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-600	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-600	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-600	ASTM A815-WP-S UNS S31803

* VALVES

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-600	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-600	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS
ISSUE DATE : DECEMBER 1998

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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 (WELDED)	74.36.57										170.1	187.1	204.1	219.1	237.1	252.1	267.1
PIPE	74.36.58	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1							
* FLANGES																	
BLIND FLANGE	76.66.01	152.1	154.1	156.1	158.1	160.1	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	76.88.24	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	148.1	150.1	152.1
SPADE BLIND	76.88.41	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	148.1	150.1	152.1
SPACER RING TYPE (ASME FLANGE)	76.88.23	372.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1	388.1	390.1	392.1	394.1	396.1	398.1	400.1	402.1
WELDING NECK FLANGE	76.66.29	652.1	654.1	656.1	658.1	660.1	662.1	664.1	666.1	702.1	704.1	640.1	642.1	644.1	646.1	648.1	650.1
* FITTINGS																	
CAP BUTT-WELD.END	76.36.05	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1	237.1	252.1	267.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1	237.1	252.1	267.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1	237.1	252.1	267.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1	237.1	252.1	267.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	670.1	671.1	673.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
CHECK VALVE FLANGED	77.13.41	203.1	204.1	205.1	207.1												
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	170.1	171.1	173.1
GATE VALVE FLANGED	77.23.41	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.33.41	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1								
MONOFL SINGLE BLOCK BALL	77.03.92	463.1	464.1	465.1	467.1	468.1											
* MISCELLANEOUS																	
GASKET, SPIRAL WOUND	85.43.58	204.1	206.1	208.1	212.1	214.1	168.1	170.1	174.1	176.1	178.1	180.1	182.1	184.1	186.1	188.1	192.1
METER RUN	76.65.96	652.1	654.1	656.1	658.1												
ORIFICE FLANGE SET	76.66.90					636.1	638.1	640.1	642.1	668.1	670.1	845.1	846.1	847.1	848.1	849.1	850.1

RUN* BR	BROB	RECB	REEB	TERB	BROB	RECB	REEB	TERB	BNIF	BNIP
	76.	76.	76.	76.	76.	76.	76.	76.	76.80.35	76.80.34
BRANCH	RUN-PIPE									
15	40-150	321.1	241.1							
20	200-600	322.1	242.1							
20	40- 80	323.1	243.1							
25	100-600	324.1	244.1							
25	40- 40	325.1	305.1							
	50- 50	326.1	306.1							
	80-100	327.1	307.1							
40	150-600	328.1	308.1							
	50- 50	330.1	309.1							
	80- 80	331.1	310.1							
	100-100	332.1	311.1							
	150-300	333.1	312.1							
	350-600	334.1	313.1							
15	40-150	321.1	241.1							
20	200-600	322.1	242.1							
20	40- 80	323.1	243.1							
25	100-600	324.1	244.1							
25	40- 40	325.1	305.1							
	50- 50	326.1	306.1							
	80-100	327.1	307.1							
40	150-600	328.1	308.1							
	50- 50	330.1	309.1							
	80- 80	331.1	310.1							
	100-100	332.1	311.1							
	150-300	333.1	312.1							
	350-600	334.1	313.1							
LEVEL	DISPLACER	CHAMBER	THERMOWELL							
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER						
-----	-----		-----	-----						
356	76.80.62.462.1		230	76.83.36.251.1						
813	76.80.62.464.1		255	76.83.36.252.1						
1219	76.80.62.466.1		305	76.83.36.253.1						
1524	76.80.62.468.1		355	76.83.36.255.1						
1829	76.80.62.470.1		405	76.83.36.256.1						
2134	76.80.62.472.1		455	76.83.36.257.1						
2438	76.80.62.474.1									
2743	76.80.62.476.1									
3048	76.80.62.478.1									

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	3/4	*	110	66.330.1	15	4	3/4	*	110
20	4	3/4	*	110	66.330.1	20	4	3/4	*	120
25	4	7/8	*	130	66.403.1	25	4	7/8	*	130
40	4	1	*	140	66.469.1	40	4	1	*	140
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				
450	20	1	7/8	*	330	66.786.1				
500	20	2		*	410	66.825.1				
600	20	2	1/2	*	520	86.703.1				

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	1/8	*	180	100	8	1/8	*	200
150	12	1/8	*	210	150	12	1/8	*	230
200	12	3/8	*	240	200	12	3/8	*	270
250	16	3/8	*	250	250	16	3/8	*	290
300	20	3/8	*	280	300	20	3/8	*	310
350	20	1/2	*	300	350	20	1/2	*	350
400	20	5/8	*	310	400	20	5/8	*	360
450	20	1/8	*	350	450	20	1/8	*	420
500	20	2	*	440	500	20	2	*	500
600	20	2	1/2	* 540	600	20	2	1/2	* 620

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	7/8	* 220	66.417.1
80	8	7/8	* 230	66.418.1
100	8	1/8	* 280	66.549.1
150	12	1/8	* 360	66.562.1
200	12	3/8	* 440	66.673.1
250	16	3/8	* 490	66.674.1
300	20	3/8	* 560	86.217.1
350	20	1/2	* 640	86.295.1
400	20	5/8	* 690	86.370.1
450	20	7/8	* 780	86.519.1
500	20	2	* 860	86.595.1

ASSEMBLIES

```

* DRAIN POINT                      DN 15  FIG.DF  DN 15 - 25
Branch:N (N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                      1  76.66.01.152.1
GASKET, SPIRAL WOUND              2  85.43.58.204.1
MONOFL SINGLE BLOCK BALL          1  77.03.92.463.1
WELDING NECK FLANGE              1  76.66.29.652.1

```

```
* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE          1  76.66.01.154.1
GASKET, SPIRAL WOUND  2  85.43.58.206.1
MONOFL SINGLE BLOCK BALL  1  77.03.92.464.1
WELDING NECK FLANGE   1  76.66.29.654.1
```

```

* DRAIN POINT          DN 20 FIG.DE   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE          1   76.66.01.154.1
GASKET, SPIRAL WOUND  2   85.43.58.206.1
MONOFL SINGLE BLOCK BALL 1  77.03.92.464.1

```

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab;:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.863.1
WELDING NECK FLANGE        2  76.66.29.652.1

```

* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab;:S=BNIF;:=N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.204.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.863.1	
WELDING NECK FLANGE	1	76.66.29.652.1	

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.863.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.863.1
WELDING NECK FLANGE       1      76.66.29.652.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1

```

```

* 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  76.65.61.018.1
GASKET, SPIRAL WOUND                 1  85.43.58.212.1
STUD BOLT WITH NUTS                   4  81.38.66.472.1
THERMOWELL STRAIGHT                   1  76.83.36.251.1
                                L=230 MM

```

```

* 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   76.65.61.018.1
GASKET, SPIRAL WOUND                 1   85.43.58.212.1
STUD BOLT WITH NUTS                  4   81.38.66.472.1
THERMOWELL STRAIGHT                  1   76.83.36.252.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.152.1
GASKET, SPIRAL WOUND        2  85.43.58.204.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.043.1
WELDING NECK FLANGE        1  76.66.29.652.1

```

```

* VENT POINT                DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.154.1
GASKET, SPIRAL WOUND        2  85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.044.1
WELDING NECK FLANGE        1  76.66.29.654.1

```

```

* VENT POINT                DN 20  FIG.DE   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                1   76.66.01.154.1
GASKET, SPIRAL WOUND        2   85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1   77.33.46.044.1

```

CLASS 93833

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 50 75 100 120

PRESSURE BAR GA

DN15 -400 152.7 152.7 150.9 147.5 143.4

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
 - FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE											
	15	20	25	40	50	80	100	150	200	250	300	350
400	C	C	C	C	E	E	E	E	B	B	B	B
350	C	C	C	C	E	E	E	B	B	B	B	A
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	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	40S
40	40S
50	40S
80	40S
100	40S
150	40S
200	80S
250	80S
300	60
350	60
400	60

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.

DUPLEX, UNS S31803, LOW TEMP	PLANT :	
CLASS NO. : 93833	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 93833, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN250-400	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-200	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-400	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-400	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-400	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-400	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-400	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-400	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A815-WP-S UNS S31803

* VALVES

BNFF BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BNRF BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNFB MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-400	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-400	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 93833, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE															
PIPE (WELDED)	74.36.57										170.1	187.1	204.1	219.1	
PIPE	74.36.58	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1					
* FLANGES															
BLIND FLANGE	76.66.01	152.1	154.1	156.1	158.1	160.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1	
SPECTACLE BLIND FLANGE	76.88.24	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	
SPADE BLIND	76.88.41	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)	76.88.23	372.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1	388.1	390.1	392.1	394.1	396.1	
WELDING NECK FLANGE	76.66.29	652.1	654.1	656.1	658.1	660.1	662.1	664.1	666.1	702.1	704.1	640.1	642.1	644.1	
* FITTINGS															
CAP BUTT-WELD.END	76.36.05	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1	
EQUAL TEE BUTT-WELD ENDS	76.36.74	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1	
* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.03.86					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RB TRUNNION NON EXT	77.03.86					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1	
BALL VALVE RED. BORE TRUN FLGD	77.03.81					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
CHECK VALVE FLANGED	77.13.41	203.1	204.1	205.1	207.1										
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1	
GATE VALVE FLANGED	77.23.41	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.33.41	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1						
MONOFL SINGLE BLOCK BALL	77.03.92	463.1	464.1	465.1	467.1	468.1									
* MISCELLANEOUS															
GASKET, SPIRAL WOUND	85.43.58	204.1	206.1	208.1	212.1	214.1	168.1	170.1	174.1	176.1	178.1	180.1	182.1	184.1	
METER RUN	76.65.96	652.1	654.1	656.1	658.1										
ORIFICE FLANGE SET	76.66.90					636.1	638.1	640.1	642.1	668.1	670.1	845.1	846.1	847.1	

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.49.102.1			
25* 15		36.43.021.1	36.58.021.1	36.83.021.1	400* 80	78.49.112.1			
25* 20		36.43.037.1	36.58.037.1	36.83.037.1	400*100	78.49.122.1			
40* 15		36.43.053.1	36.58.053.1	36.83.053.1	400*150	78.49.130.1			
40* 20		36.43.071.1	36.58.071.1	36.83.071.1	400*200		36.43.641.1	36.58.641.1	36.83.624.1
40* 25		36.43.087.1	36.58.087.1	36.83.087.1	400*250		36.43.661.1	36.58.661.1	36.83.660.1
50* 20		36.43.103.1	36.58.103.1	36.83.103.1	400*300		36.43.669.1	36.58.669.1	36.83.669.1
50* 25		36.43.121.1	36.58.121.1	36.83.121.1	400*350		36.43.687.1	36.58.687.1	36.83.687.1
50* 40		36.43.137.1	36.58.137.1	36.83.137.1					
80* 40		36.43.153.1	36.58.153.1	36.83.153.1					
80* 50		36.43.171.1	36.58.171.1	36.83.171.1					
100* 40		36.43.187.1	36.58.187.1	36.83.187.1					
100* 50		36.43.206.1	36.58.206.1	36.83.206.1					
100* 80		36.43.225.1	36.58.225.1	36.83.225.1					
150* 50	78.49.632.1								
150* 80		36.43.244.1	36.58.244.1	36.83.244.1					
150*100		36.43.261.1	36.58.261.1	36.83.261.1					
200* 50	78.50.186.1								
200* 80	78.50.208.1								
200*100		36.43.290.1	36.58.288.1	36.83.288.1					
200*150		36.43.312.1	36.58.312.1	36.83.312.1					
250* 50	78.50.188.1								
250* 80	78.50.210.1								
250*100	78.50.224.1								
250*150		36.43.360.1	36.58.360.1	36.83.366.1					
250*200		36.43.380.1	36.58.380.1	36.83.380.1					
300* 50	78.49.100.1								
300* 80	78.49.110.1								
300*100	78.49.120.1								
300*150		36.43.424.1	36.58.424.1	36.83.424.1					
300*200		36.43.458.1	36.58.458.1	36.83.458.1					
300*250		36.43.491.1	36.58.491.1	36.83.491.1					
350* 50	78.49.101.1								
350* 80	78.49.111.1								
350*100	78.49.121.1								
350*150		36.43.519.1	36.58.519.1	36.83.519.1					
350*200		36.43.548.1	36.58.548.1	36.83.549.1					
350*250		36.43.582.1	36.58.582.1	36.83.582.1					
350*300		36.43.600.1	36.58.600.1	36.83.600.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE	-----	
15	40-150	321.1	241.1
	200-400	322.1	242.1
20	40- 80	323.1	243.1
	100-400	324.1	244.1
25	40- 40	325.1	305.1
	50- 50	326.1	306.1
	80-100	327.1	307.1
	150-400	328.1	308.1
40	50- 50	330.1	309.1
	80- 80	331.1	310.1
	100-100	332.1	311.1
	150-300	333.1	312.1
	350-400	334.1	313.1

LEVEL	DISPLACER	CHAMBER	THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.62.462.1		230	76.83.36.251.1
813	76.80.62.464.1		255	76.83.36.252.1
1219	76.80.62.466.1		305	76.83.36.253.1
1524	76.80.62.468.1		355	76.83.36.255.1
1829	76.80.62.470.1		405	76.83.36.256.1
2134	76.80.62.472.1		455	76.83.36.257.1
2438	76.80.62.474.1			
2743	76.80.62.476.1			
3048	76.80.62.478.1			

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

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
20	4	3/4	*	110	63.330.1	20	4	3/4	*	120
25	4	7/8	*	130	63.403.1	25	4	7/8	*	130
40	4	1	*	140	63.469.1	40	4	1	*	140
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					
350	20	1 1/2	*	280	63.693.1					
400	20	1 5/8	*	290	63.724.1					

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

81.38

DN	NR	INCH	* MM	
50	8	7/8	* 220	63.417.1
80	8	7/8	* 230	63.418.1
100	8	1/8	* 280	63.549.1
150	12	1/8	* 360	63.562.1
200	12	3/8	* 440	63.666.1
250	16	3/8	* 490	63.674.1
300	20	3/8	* 560	63.669.1
350	20	1/2	* 640	63.716.1
400	20	5/8	* 690	63.754.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE          1  76.66.01.152.1
GASKET, SPIRAL WOUND  2  85.43.58.204.1
MONOFL SINGLE BLOCK BALL  1  77.03.92.463.1
WELDING NECK FLANGE   1  76.66.29.652.1

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```

* DRAIN POINT          DN 20  FIG.DF   DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE           1   76.66.01.154.1
GASKET, SPIRAL WOUND   2   85.43.58.206.1
MONOFL SINGLE BLOCK BALL 1   77.03.92.464.1
WELDING NECK FLANGE    1   76.66.29.654.1

```

* DRAIN POINT	DN 20	FIG.DE	DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.154.1	
GASKET, SPIRAL WOUND	2	85.43.58.206.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.464.1	

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  2    77.85.47.863.1
WELDING NECK FLANGE       2    76.66.29.652.1
```

```

* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1   85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD    1   77.85.47.863.1
WELDING NECK FLANGE               1   76.66.29.652.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
```

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.863.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
WELDING NECK FLANGE       1  76.66.29.652.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1

```

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* 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  76.65.61.018.1
GASKET, SPIRAL WOUND                 1  85.43.58.212.1
STUD BOLT WITH NUTS                  4  81.38.63.472.1
THERMOWELL STRAIGHT L=230 MM         1  76.83.36.251.1

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* 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   76.65.61.018.1
GASKET, SPIRAL WOUND                  1   85.43.58.212.1
STUD BOLT WITH NUTS                   4   81.38.63.472.1
THERMOWELL STRAIGHT      L=255 MM    1   76.83.36.252.1

```

```

* VENT POINT                DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.152.1
GASKET, SPIRAL WOUND        2  85.43.58.204.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.043.1
WELDING NECK FLANGE        1  76.66.29.652.1

```

```

* VENT POINT                DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1    76.66.01.154.1
GASKET, SPIRAL WOUND        2    85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1    77.33.46.044.1
WELDING NECK FLANGE        1    76.66.29.654.1

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* VENT POINT                DN 20  FIG.DE   DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                1   76.66.01.154.1
GASKET, SPIRAL WOUND        2   85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1   77.33.46.044.1

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CLASS 93834

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 120

PRESSURE BAR GA
DN15 -400 137.5 137.5

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
- FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B B B B A
350	C	C	C	C	E	E	E	B	B	B B A
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	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	40S
40	40S
50	40S
80	40S
100	40S
150	40S
200	80S
250	80S
300	60
350	60
400	60

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.

DUPLEX, UNS S31803, LT SOUR	PLANT :	
CLASS NO. : 93834	CONSIGNEE :	
ANS RATING : CLASS 900	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPD PIPE (WELDED)	DN250-400	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-200	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-400	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-400	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-400	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-400	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-400	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-400	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A815-WP-S UNS S31803

* VALVES

BNFF BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BNRF BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNf MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-400	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-400	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWSG THERMOWELL STRAIGHT	DN 40- 40	ASTM A182-F51

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

* PIPE															
PIPE (WELDED)		74.36.57										170.1	187.1	204.1	219.1
PIPE		74.36.58	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1				
* FLANGES															
BLIND FLANGE		76.66.01	152.1	154.1	156.1	158.1	160.1	122.1	124.1	126.1	128.1	130.1	132.1	134.1	136.1
SPECTACLE BLIND FLANGE		76.88.24	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
SPADE BLIND		76.88.41	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)		76.88.23	372.1	374.1	376.1	378.1	380.1	382.1	384.1	386.1	388.1	390.1	392.1	394.1	396.1
WELDING NECK FLANGE		76.66.29	652.1	654.1	656.1	658.1	660.1	662.1	664.1	666.1	702.1	704.1	640.1	642.1	644.1
* FITTINGS															
CAP BUTT-WELD.END		76.36.05	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1
ELBOW 45 DEG BUTT-WELD ENDS		76.36.15	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1
ELBOW 90 DEG BUTT-WELD ENDS		76.36.25	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1
EQUAL TEE BUTT-WELD ENDS		76.36.74	036.1	046.1	056.1	076.1	086.1	106.1	126.1	146.1	158.1	170.1	187.1	204.1	219.1
* VALVES															
BALL VALVE FB TRUNNION NON EXT		77.03.86					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1
BALL VALVE RB TRUNNION NON EXT		77.03.86					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
BALL VALVE FULL BORE TRUN FLGD		77.03.81					708.1	660.1	662.1	664.1	665.1	666.1	667.1	668.1	669.1
BALL VALVE RED. BORE TRUN FLGD		77.03.81					208.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
CHECK VALVE FLANGED		77.13.41	203.1	204.1	205.1	207.1									
DUAL PL. CHECK VALVE WAFER LUG		77.68.41					158.1	160.1	162.1	164.1	165.1	166.1	167.1	168.1	169.1
GATE VALVE FLANGED		77.23.41	203.1	204.1	205.1	207.1									
GLOBE VALVE FLANGED		77.33.41	203.1	204.1	205.1	207.1	208.1	160.1	162.1	164.1					
MONOFL SINGLE BLOCK BALL		77.03.92	463.1	464.1	465.1	467.1	468.1								
* MISCELLANEOUS															
GASKET, SPIRAL WOUND		85.43.58	204.1	206.1	208.1	212.1	214.1	168.1	170.1	174.1	176.1	178.1	180.1	182.1	184.1
METER RUN		76.65.96	652.1	654.1	656.1	658.1									
ORIFICE FLANGE SET		76.66.90					636.1	638.1	640.1	642.1	668.1	670.1	845.1	846.1	847.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		36.43.003.1	36.58.003.1	36.83.003.1	400* 50	78.49.102.1			
25* 15		36.43.021.1	36.58.021.1	36.83.021.1	400* 80	78.49.112.1			
25* 20		36.43.037.1	36.58.037.1	36.83.037.1	400*100	78.49.122.1			
40* 15		36.43.053.1	36.58.053.1	36.83.053.1	400*150	78.49.130.1			
40* 20		36.43.071.1	36.58.071.1	36.83.071.1	400*200		36.43.641.1	36.58.641.1	36.83.624.1
40* 25		36.43.087.1	36.58.087.1	36.83.087.1	400*250		36.43.661.1	36.58.661.1	36.83.660.1
50* 20		36.43.103.1	36.58.103.1	36.83.103.1	400*300		36.43.669.1	36.58.669.1	36.83.669.1
50* 25		36.43.121.1	36.58.121.1	36.83.121.1	400*350		36.43.687.1	36.58.687.1	36.83.687.1
50* 40		36.43.137.1	36.58.137.1	36.83.137.1					
80* 40		36.43.153.1	36.58.153.1	36.83.153.1					
80* 50		36.43.171.1	36.58.171.1	36.83.171.1					
100* 40		36.43.187.1	36.58.187.1	36.83.187.1					
100* 50		36.43.206.1	36.58.206.1	36.83.206.1					
100* 80		36.43.225.1	36.58.225.1	36.83.225.1					
150* 50	78.49.632.1								
150* 80		36.43.244.1	36.58.244.1	36.83.244.1					
150*100		36.43.261.1	36.58.261.1	36.83.261.1					
200* 50	78.50.186.1								
200* 80	78.50.208.1								
200*100		36.43.290.1	36.58.288.1	36.83.288.1					
200*150		36.43.312.1	36.58.312.1	36.83.312.1					
250* 50	78.50.188.1								
250* 80	78.50.210.1								
250*100	78.50.224.1								
250*150		36.43.360.1	36.58.360.1	36.83.366.1					
250*200		36.43.380.1	36.58.380.1	36.83.380.1					
300* 50	78.49.100.1								
300* 80	78.49.110.1								
300*100	78.49.120.1								
300*150		36.43.424.1	36.58.424.1	36.83.424.1					
300*200		36.43.458.1	36.58.458.1	36.83.458.1					
300*250		36.43.491.1	36.58.491.1	36.83.491.1					
350* 50	78.49.101.1								
350* 80	78.49.111.1								
350*100	78.49.121.1								
350*150		36.43.519.1	36.58.519.1	36.83.519.1					
350*200		36.43.548.1	36.58.548.1	36.83.549.1					
350*250		36.43.582.1	36.58.582.1	36.83.582.1					
350*300		36.43.600.1	36.58.600.1	36.83.600.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE	-----	
15	40-150	321.1	241.1
	200-400	322.1	242.1
20	40- 80	323.1	243.1
	100-400	324.1	244.1
25	40- 40	325.1	305.1
	50- 50	326.1	306.1
	80-100	327.1	307.1
	150-400	328.1	308.1
40	50- 50	330.1	309.1
	80- 80	331.1	310.1
	100-100	332.1	311.1
	150-300	333.1	312.1
	350-400	334.1	313.1

LEVEL	DISPLACER	CHAMBER	THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.62.462.1		230	76.83.36.251.1
813	76.80.62.464.1		255	76.83.36.252.1
1219	76.80.62.466.1		305	76.83.36.253.1
1524	76.80.62.468.1		355	76.83.36.255.1
1829	76.80.62.470.1		405	76.83.36.256.1
2134	76.80.62.472.1		455	76.83.36.257.1
2438	76.80.62.474.1			
2743	76.80.62.476.1			
3048	76.80.62.478.1			

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

BOLTSET METER-RUN

81.38					81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM
15	4	3/4	*	110	67.330.1	15	4	3/4	*	110
20	4	3/4	*	110	67.330.1	20	4	3/4	*	120
25	4	7/8	*	130	67.403.1	25	4	7/8	*	130
40	4	1	*	140	67.469.1	40	4	1	*	140
50	8	7/8	*	150	67.406.1					
80	8	7/8	*	150	67.406.1					
100	8	1	1/8	*	170	67.532.1				
150	12	1	1/8	*	190	67.535.1				
200	12	1	3/8	*	220	67.643.1				
250	16	1	3/8	*	240	67.646.1				
300	20	1	3/8	*	250	67.647.1				
350	20	1	1/2	*	280	67.693.1				
400	20	1	5/8	*	290	67.724.1				

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

81.38

DN	NR	INCH	* MM	
50	8	7/8	* 220	67.417.1
80	8	7/8	* 230	67.418.1
100	8	1/8	* 280	67.549.1
150	12	1/8	* 360	67.562.1
200	12	3/8	* 440	67.672.1
250	16	3/8	* 490	67.677.1
300	20	3/8	* 560	67.680.1
350	20	1/2	* 640	67.715.1
400	20	5/8	* 690	67.769.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE          1  76.66.01.152.1
GASKET, SPIRAL WOUND  2  85.43.58.204.1
MONOFL SINGLE BLOCK BALL  1  77.03.92.463.1
WELDING NECK FLANGE  1  76.66.29.652.1

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```
* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COM.)
BLIND FLANGE          1  76.66.01.154.1
GASKET, SPIRAL WOUND  2  85.43.58.206.1
MONOFL SINGLE BLOCK BALL  1  77.03.92.464.1
WELDING NECK FLANGE   1  76.66.29.654.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-400
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.66.01.154.1		
GASKET, SPIRAL WOUND	2	85.43.58.206.1		
MONOFL SINGLE BLOCK BALL	1	77.03.92.464.1		

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 2    77.85.47.863.1
WELDING NECK FLANGE       2    76.66.29.652.1
```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1   85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD    1   77.85.47.863.1
WELDING NECK FLANGE               1   76.66.29.652.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
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ISSUE DATE : DECEMBER 1998

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.863.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
WELDING NECK FLANGE       1      76.66.29.652.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1

```

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* 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  76.65.61.018.1
GASKET, SPIRAL WOUND                 1  85.43.58.212.1
STUD BOLT WITH NUTS                   4  81.38.67.472.1
THERMOWELL STRAIGHT L=230 MM          1  76.83.36.251.1

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```

* 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   76.65.61.018.1
GASKET, SPIRAL WOUND                 1   85.43.58.212.1
STUD BOLT WITH NUTS                  4   81.38.67.472.1
THERMOWELL STRAIGHT                  1   76.83.36.252.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.152.1
GASKET, SPIRAL WOUND        2  85.43.58.204.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.043.1
WELDING NECK FLANGE         1  76.66.29.652.1

```

```

* VENT POINT                DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.154.1
GASKET, SPIRAL WOUND        2  85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE  1  77.33.46.044.1
WELDING NECK FLANGE         1  76.66.29.654.1

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* VENT POINT                DN 20 FIG.DE    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                1    76.66.01.154.1
GASKET, SPIRAL WOUND        2    85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1    77.33.46.044.1

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PIPING CLASSES ASME RATING 1500

CLASS 151410

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 254.2 250.4 240.2 231.9 229.5

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.
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	160
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	160
300	C	C	C	C	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	160
100	C	C	C	B	B	B	A										250	160
80	C	C	C	B	B	A											300	160
50	C	B	B	B	A												350	38.0
40	B	B	B	A													400	42.0
25	B	B	A														450	46.0
20	B	A															500	52.0
15	A																600	62.0

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.

CARBON STEEL	PLANT	:	
CLASS NO. : 151410	CONSIGNEE	:	
ANS RATING : CLASS 1500	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 07/97	PROJECT NO.	:	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-300	ASTM A106-B
		DN350-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* 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
		DN250-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

		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	073.1	113.1	161.1	227.1	267.1	309.1	349.1					
	74.30.14												290.1	350.1	420.1	500.1	580.1
* 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	438.1	440.1	444.1
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	188.1	190.1	192.1
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	188.1	190.1	192.1
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					
	76.62.84												290.1	350.1	420.1	500.1	580.1
* 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							
	76.31.15												290.1	350.1	420.1	500.1	580.1
	76.31.18										315.1	337.1					
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							
	76.31.38										315.1	337.1					
	76.31.44												290.1	350.1	410.1	460.1	530.1
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							
	76.31.39										315.1	337.1					
	76.31.46												290.1	350.1	420.1	500.1	580.1
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							
	76.31.84										315.1	337.1					
	76.31.90												290.1	350.1	420.1	500.1	580.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.72					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1			
BALL VALVE RED. BORE TRUN FLGD	77.00.72					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1			
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1												
	77.10.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1												
	77.30.23					208.1	210.1	212.1									
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1											
* 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	536.1	538.1	542.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					970.1	972.1	974.1	976.1	978.1	980.1	982.1					

	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	79.09.250.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.09.520.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.09.754.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.09.785.1	31.62.759.1	31.63.756.1	31.93.750.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200		31.62.805.1	31.63.809.1	31.93.801.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250		31.62.854.1	31.63.855.1	31.93.850.1
50* 20		29.46.195.1	29.61.195.1	30.89.098.1	400*300		31.62.900.1	31.63.900.1	31.93.900.1
50* 25		30.72.201.1	30.73.201.1	30.89.107.1	400*350		31.62.951.1	31.63.951.1	31.93.951.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1	450* 50	79.09.266.1			
80* 40		30.72.231.1	30.73.231.1	30.89.125.1	450* 80	79.09.550.1			
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1	450*100	79.09.759.1			
100* 40		30.72.259.1	30.73.259.1	30.89.143.1	450*150	79.09.815.1			
100* 50	79.03.182.1	30.72.271.1	30.73.271.1	30.89.155.1	450*200		31.48.030.1	31.49.030.1	31.92.010.1
100* 80	79.03.206.1	30.72.281.1	30.73.281.1	30.89.167.1	450*250		31.48.050.1	31.49.050.1	31.92.050.1
150* 50	79.03.184.1				450*300		31.48.100.1	31.49.100.1	31.92.100.1
150* 80	79.03.208.1	30.72.301.1	30.73.301.1	30.89.179.1	450*350		31.48.151.1	31.49.151.1	31.92.151.1
150*100	79.03.230.1	30.72.311.1	30.73.311.1	30.89.192.1	450*400		31.48.201.1	31.49.201.1	31.92.201.1
200* 50	79.03.186.1				500* 50	79.09.276.1			
200* 80	79.03.210.1				500* 80	79.09.570.1			
200*100	79.03.232.1	30.72.331.1	30.73.331.1	30.89.208.1	500*100	79.09.764.1			
200*150	79.03.252.1	30.72.341.1	30.73.341.1	30.89.228.1	500*150	79.09.845.1			
250* 50	79.07.188.1				500*200	79.09.915.1	31.48.290.1	31.49.290.1	31.92.250.1
250* 80	79.07.212.1				500*250		31.48.320.1	31.49.320.1	31.92.300.1
250*100	79.07.234.1	31.70.349.1	31.71.349.1	31.85.256.1	500*300		31.48.350.1	31.49.501.1	31.92.350.1
250*150	79.07.254.1	31.70.360.1	31.71.360.1	31.85.274.1	500*350		31.48.401.1	31.49.401.1	31.92.401.1
250*200	79.07.272.1	31.70.370.1	31.71.370.1	31.85.296.1	500*400		31.48.451.1	31.49.451.1	31.92.451.1
300* 50	79.07.190.1				500*450		31.48.501.1	31.49.501.1	31.92.501.1
300* 80	79.07.214.1				600* 50	79.09.294.1			
300*100	79.07.236.1				600* 80	79.09.590.1			
300*150	79.07.256.1	31.70.389.1	31.71.389.1	31.85.313.1	600*100	79.09.768.1			
300*200	79.07.274.1	31.70.400.1	31.71.400.1	31.85.333.1	600*150	79.09.875.1			
300*250	79.07.290.1	31.70.410.1	31.71.410.1	31.85.355.1	600*200	79.09.945.1			
350* 50	79.09.220.1				600*250	79.09.970.1	31.48.620.1	31.49.620.1	
350* 80	79.09.470.1				600*300		31.48.650.1	31.49.650.1	31.92.600.1
350*100	79.09.725.1				600*350		31.48.670.1	31.49.670.1	31.92.651.1
350*150		31.62.558.1	31.63.663.1	31.93.562.1	600*400		31.48.701.1	31.49.701.1	31.92.701.1
350*200		31.62.613.1	31.63.614.1	31.93.562.1	600*450		31.48.751.1	31.49.751.1	31.92.751.1
350*250		31.62.660.1	31.63.660.1	31.93.614.1	600*500		31.48.801.1	31.49.801.1	31.92.801.1
350*300		31.62.705.1	31.63.705.1	31.93.661.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	321.1	016.1
20	40-600	323.1	018.1
25	40-100	325.1	020.1
	150-600	326.1	024.1
40	50-100	330.1	026.1
	150-600	331.1	028.1
50	80-100	336.1	
	150-250	337.1	
	300-600	338.1	

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.122.1		230	76.83.37.501.1
813	76.80.60.124.1		255	76.83.37.502.1
1219	76.80.60.126.1		305	76.83.37.503.1
1524	76.80.60.128.1		355	76.83.37.505.1
1829	76.80.60.130.1		405	76.83.37.506.1
2134	76.80.60.132.1		455	76.83.37.507.1
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
20	4	3/4	*	120	61.332.1	20	4	3/4	*	120
25	4	7/8	*	130	61.403.1	25	4	7/8	*	130
40	4	1	*	140	61.469.1	40	4	1	*	140
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					
450	16	2 3/4	*	580	83.779.1					
500	16	3	*	640	83.855.1					
600	16	3 1/2	*	730	83.934.1					

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	3/8	*	280	61.652.1		150	12	3/8	*	300	61.655.1
200	12	5/8	*	360	61.736.1		200	12	5/8	*	400	61.741.1
250	12	7/8	*	420	61.802.1		250	12	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
450	16	2 3/4	*	600	83.781.1		450	16	2 3/4	*	680	83.789.1
500	16	3	*	660	83.857.1		500	16	3	*	750	83.866.1
600	16	3 1/2	*	750	83.936.1		600	16	3 1/2	*	860	83.945.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	61.417.1
80	8	1 1/8	* 270	61.558.1
100	8	1 1/4	* 300	61.610.1
150	12	3/8	* 430	61.671.1
200	12	5/8	* 560	83.357.1
250	12	7/8	* 640	83.505.1
300	16		* 740	83.585.1
350	16	1 1/4	* 830	83.663.1
400	16	1 1/2	* 890	83.737.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.463.1
WELDING NECK FLANGE    1  76.62.79.962.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.464.1
WELDING NECK FLANGE    1  76.62.79.964.1

```

* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1	

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2    77.85.47.063.1
WELDING NECK FLANGE       2    76.62.79.962.1
```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.063.1
WELDING NECK FLANGE               1  76.62.79.962.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB  DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.063.1
WELDING NECK FLANGE       1      76.62.79.962.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

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* 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                   1  76.83.37.501.1
                                L=230 MM

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```

* 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   76.62.60.537.1
GASKET, SPIRAL WOUND                 1   85.41.46.512.1
STUD BOLT WITH NUTS                   4   81.38.61.472.1
THERMOWELL TAPERED                   1   76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE        1  76.62.79.962.1

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```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.79.964.1

```

* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	

CLASS 151420

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

PRESSURE BAR GA
DN15 -600 222.3 222.3

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
 - 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
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	160
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	160
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	160
300	C	C	C	C	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	160
100	C	C	C	B	B	B	A										250	160
80	C	C	C	B	B	A											300	160
50	C	B	B	B	A												350	38.0
40	B	B	B	A													400	42.0
25	B	B	A														450	46.0
20	B	A															500	52.0
15	A																600	62.0

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.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 151420	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 151420, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A106-B
		DN250-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* 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
		DN250-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 151420, REV.A PAGE 3
ISSUE DATE : DECEMBER 1998

		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	113.1	161.1	227.1	267.1							
	74.30.15																
	74.30.16										113.1	125.1	290.1	350.1	420.1	500.1	580.1
* 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	438.1	440.1	444.1
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	188.1	190.1	192.1
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	188.1	190.1	192.1
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					
	76.62.84												290.1	350.1	420.1	500.1	580.1
* 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							
	76.31.16																
	76.31.17										315.1	337.1	290.1	350.1	420.1	500.1	580.1
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							
	76.31.34										315.1	337.1					
	76.31.45												290.1	350.1	420.1	500.1	580.1
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							
	76.31.43										315.1	337.1					
	76.31.47												290.1	350.1	420.1	500.1	580.1
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							
	76.31.80										315.1	337.1					
	76.31.91												290.1	350.1	420.1	500.1	580.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.72					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1			
BALL VALVE RED. BORE TRUN FLGD	77.00.72					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1			
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1												
	77.10.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1												
	77.30.23					208.1	210.1	212.1									
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1											
* 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	536.1	538.1	542.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					970.1	972.1	974.1	976.1	978.1	980.1	982.1					

	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	79.09.250.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.09.520.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.09.754.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.09.785.1	31.64.750.1	31.65.751.1	31.94.750.1
40* 20		30.66.181.1	30.67.181.1	30.88.079.1	400*200		31.64.800.1	31.65.801.1	31.94.801.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250		31.64.850.1	31.65.851.1	31.94.850.1
50* 20		30.66.195.1	30.67.195.1	30.88.098.1	400*300		31.64.900.1	31.65.900.1	31.94.900.1
50* 25		30.66.201.1	30.67.201.1	30.88.107.1	400*350		31.64.951.1	31.65.951.1	31.94.951.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1	450* 50	79.09.266.1			
80* 40		30.66.231.1	30.67.231.1	30.88.125.1	450* 80	79.09.550.1			
80* 50	79.03.180.1	30.66.241.1	30.67.241.1	30.88.134.1	450*100	79.09.759.1			
100* 40		30.66.259.1	30.67.259.1	30.88.143.1	450*150	79.09.815.1			
100* 50	79.03.182.1	30.66.271.1	30.67.271.1	30.88.155.1	450*200		31.50.030.1	31.51.030.1	31.97.010.1
100* 80	79.03.206.1	30.66.281.1	30.67.281.1	30.88.167.1	450*250		31.50.050.1	31.51.050.1	31.97.050.1
150* 50	79.03.184.1				450*300		31.50.100.1	31.51.100.1	31.97.100.1
150* 80	79.03.208.1	30.66.301.1	30.67.301.1	30.88.179.1	450*350		31.50.151.1	31.51.151.1	31.97.151.1
150*100	79.03.230.1	30.66.311.1	30.67.311.1	30.88.192.1	450*400		31.50.201.1	31.51.201.1	31.97.201.1
200* 50	79.03.186.1				500* 50	79.09.276.1			
200* 80	79.03.210.1				500* 80	79.09.570.1			
200*100	79.03.232.1	30.66.331.1	30.67.331.1	30.88.208.1	500*100	79.09.764.1			
200*150	79.03.252.1	30.66.341.1	30.67.341.1	30.88.228.1	500*150	79.09.845.1			
250* 50	79.07.188.1				500*200	79.09.915.1	31.50.290.1	31.51.290.1	31.97.250.1
250* 80	79.07.212.1				500*250		31.50.320.1	31.51.320.1	31.97.300.1
250*100	79.07.234.1	31.66.349.1	31.75.349.1	31.88.256.1	500*300		31.50.350.1	31.51.350.1	31.97.350.1
250*150	79.07.254.1	31.66.360.1	31.75.349.1	31.88.274.1	500*350		31.50.401.1	31.51.401.1	31.97.401.1
250*200	79.07.272.1	31.66.370.1	31.75.370.1	31.88.296.1	500*400		31.50.451.1	31.51.451.1	31.97.451.1
300* 50	79.07.190.1				500*450		31.50.501.1	31.51.501.1	31.97.501.1
300* 80	79.07.214.1				600* 50	79.09.294.1			
300*100	79.07.236.1				600* 80	79.09.590.1			
300*150	79.07.256.1	31.66.389.1	31.75.389.1	31.88.313.1	600*100	79.09.768.1			
300*200	79.07.274.1	31.66.400.1	31.75.400.1	31.88.333.1	600*150	79.09.875.1			
300*250	79.07.290.1	31.66.410.1	31.75.410.1	31.88.355.1	600*200	79.09.945.1			
350* 50	79.09.220.1				600*250	79.09.970.1	31.50.620.1	31.51.620.1	
350* 80	79.09.470.1				600*300		31.50.650.1	31.51.650.1	31.97.600.1
350*100	79.09.725.1				600*350		31.50.670.1	31.51.670.1	31.97.651.1
350*150		31.64.363.1	31.65.575.1	31.94.562.1	600*400		31.50.701.1	31.51.701.1	31.97.701.1
350*200		31.64.363.1	31.65.613.1	31.94.614.1	600*450		31.50.751.1	31.51.751.1	31.97.751.1
350*250		31.64.660.1	31.65.660.1	31.94.661.1	600*500		31.50.801.1	31.51.801.1	31.97.801.1
350*300		31.64.705.1	31.65.705.1	31.94.706.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	321.1	016.1
20	40-600	323.1	018.1
25	40-100	325.1	020.1
	150-600	326.1	024.1
40	50-100	330.1	026.1
	150-600	331.1	028.1
50	80-100	336.1	
	150-250	337.1	
	300-600	338.1	

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.482.1		230	76.83.37.501.1
813	76.80.60.484.1		255	76.83.37.502.1
1219	76.80.60.486.1		305	76.83.37.503.1
1524	76.80.60.488.1		355	76.83.37.505.1
1829	76.80.60.490.1		405	76.83.37.506.1
2134	76.80.60.492.1		455	76.83.37.507.1
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

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.063.1
WELDING NECK FLANGE       1      76.62.79.962.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

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* 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                   1  76.83.37.501.1
                                L=230 MM

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* 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   76.62.60.537.1
GASKET, SPIRAL WOUND                 1   85.41.46.512.1
STUD BOLT WITH NUTS                  4   81.38.66.472.1
THERMOWELL TAPERED                   1   76.83.37.502.1
                                L=255 MM

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE         1  76.62.79.962.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.79.964.1

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* VENT POINT                      DN 20 FIG.DE   DN 50 -600
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
MONOFL SINGLE BLOCK NEEDLE       1  77.30.91.044.1

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BOLTSET WAFER CHECK VALVE

81.38					
DN	NR	INCH	*	MM	
50	8	7/8	*	220	66.417.1
80	8	1 1/8	*	270	66.550.1
100	8	1 1/4	*	300	66.610.1
150	12	3/8	*	430	66.671.1
200	12	5/8	*	560	86.357.1
250	12	7/8	*	640	86.505.1
300	16		*	740	86.585.1
350	16	1 1/4	*	830	86.663.1
400	16	1 1/2	*	890	86.737.1

CLASS 151430

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 50 75 100 120

PRESSURE BAR GA
DN15 -600 252.4 250.4 240.2 231.9 229.5

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.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	600			
600	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	15	XXS
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	XXS
450	C	C	C	C	E	E	E	E	B	B	B	B	B	A			25	XXS
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	XXS
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	XXS
300	C	C	C	C	E	E	E	E	B	B	B	A					80	XXS
250	C	C	C	C	E	E	E	E	B	B	A						100	XXS
200	C	C	C	C	E	E	E	B	B	A							150	XXS
150	C	C	C	C	E	B	B	A									200	26.0
100	C	C	C	B	B	B	A										250	32.0
80	C	C	C	B	B	A											300	36.0
50	C	B	B	B	A												350	40.0
40	B	B	B	A													400	44.0
25	B	B	A														450	48.0
20	B	A															500	54.0
15	A																600	64.0

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.

CARBON STEEL	PLANT :	
CLASS NO. : 151430	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-150	ASTM A106-B
		DN200-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-150	ASTM A234-WPB
		DN200-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-600	ASTM A420-WPL6

* 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 80-150	ASTM A105
		DN200-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-600	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

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	74.30.05	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1								
	74.30.14									142.1	182.1	232.1	292.1	352.1	422.1	502.1	582.1
* 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	438.1	440.1	444.1
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	188.1	190.1	192.1
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	188.1	190.1	192.1
WELDING NECK FLANGE	76.62.80	032.1	034.1	036.1	038.1	040.1	044.1	046.1	048.1								
	76.62.84									142.1	182.1	232.1	292.1	352.1	422.1	502.1	582.1
* FITTINGS																	
CAP BUTT-WELD.END	76.30.19	023.1	029.1	033.1	043.1	063.1	083.1	103.1	123.1								
	76.31.15									142.1	182.1	232.1	292.1	352.1	422.1	502.1	582.1
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								
	76.31.44									141.1	181.1	231.1	291.1	351.1	411.1	461.1	531.1
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								
	76.31.46									142.1	182.1	232.1	292.1	352.1	422.1	502.1	582.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1								
	76.31.90									142.1	182.1	232.1	292.1	352.1	422.1	502.1	582.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.73					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1			
BALL VALVE RED. BORE TRUN FLGD	77.00.73					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1			
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1												
	77.10.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1												
	77.30.23					208.1	210.1	212.1									
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1											
* 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	536.1	538.1	542.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					140.1	144.1	146.1	148.1								

	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	79.09.241.1			
25* 15		30.72.152.1	30.73.152.1	30.89.050.1	400* 80	79.09.501.1			
25* 20		30.72.162.1	30.73.162.1	30.89.060.1	400*100	79.09.751.1			
40* 15		30.72.172.1	30.73.172.1	30.89.070.1	400*150	79.09.771.1	31.62.772.1	31.63.765.1	
40* 20		30.72.182.1	30.73.182.1	30.89.080.1	400*200		31.62.817.1	31.63.810.1	31.93.805.1
40* 25		30.72.192.1	30.73.192.1	30.89.090.1	400*250		31.62.867.1	31.63.860.1	31.93.854.1
50* 20		29.46.196.1	29.61.196.1	30.89.103.1	400*300		31.62.904.1	31.63.904.1	31.93.904.1
50* 25		30.72.202.1	30.73.202.1	30.89.108.1	400*350		31.62.954.1	31.63.954.1	31.93.954.1
50* 40		30.72.212.1	30.73.212.1	30.89.117.1	450* 50	79.09.260.1			
80* 40		30.72.232.1	30.73.232.1	30.89.126.1	450* 80	79.09.540.1			
80* 50	79.03.680.1	30.72.242.1	30.73.242.1	30.89.135.1	450*100	79.09.756.1			
100* 40		30.72.260.1	30.73.260.1	30.89.144.1	450*150	79.09.800.1			
100* 50	79.03.682.1	30.72.272.1	30.73.272.1	30.89.156.1	450*200	79.09.890.1	31.48.032.1	31.49.032.1	31.92.016.1
100* 80	79.03.694.1	30.72.282.1	30.73.282.1	30.89.168.1	450*250		31.48.057.1	31.49.057.1	31.92.057.1
150* 50	79.03.684.1				450*300		31.48.106.1	31.49.106.1	31.92.106.1
150* 80	79.03.696.1	30.72.302.1	30.73.302.1	30.89.180.1	450*350		31.48.157.1	31.49.157.1	31.92.157.1
150*100	79.03.704.1	30.72.312.1	30.73.312.1	30.89.193.1	450*400		31.48.207.1	31.49.207.1	31.92.207.1
200* 50	79.09.061.1				500* 50	79.09.270.1			
200* 80	79.09.301.1				500* 80	79.09.560.1			
200*100		31.62.163.1	31.63.163.1	31.93.163.1	500*100	79.09.761.1			
200*150		31.62.197.1	31.63.197.1	31.93.198.1	500*150	79.09.830.1			
250* 50	79.09.091.1				500*200	79.09.930.1	31.48.296.1	31.49.296.1	31.92.256.1
250* 80	79.09.351.1				500*250		31.48.326.1	31.49.326.1	31.92.307.1
250*100	79.09.649.1	31.62.251.1	31.63.251.1	31.93.233.1	500*300		31.48.356.1	31.49.356.1	31.92.356.1
250*150		31.62.279.1	31.63.279.1	31.93.279.1	500*350		31.48.407.1	31.49.407.1	31.92.407.1
250*200		31.62.329.1	31.63.329.1	31.93.329.1	500*400		31.48.457.1	31.49.457.1	31.92.457.1
300* 50	79.09.141.1				500*450		31.48.507.1	31.49.507.1	31.92.507.1
300* 80	79.09.401.1				600* 50	79.09.290.1			
300*100	79.09.651.1				600* 80	79.09.580.1			
300*150		31.62.378.1	31.63.378.1	31.93.378.1	600*100	79.09.766.1			
300*200		31.62.441.1	31.63.441.1	31.93.440.1	600*150	79.09.860.1			
300*250		31.62.504.1	31.63.504.1	31.93.503.1	600*200	79.09.960.1			
350* 50	79.09.201.1				600*250	79.09.990.1	31.48.624.1	31.49.624.1	31.92.557.1
350* 80	79.09.451.1				600*300		31.48.654.1	31.49.654.1	31.92.606.1
350*100	79.09.701.1				600*350		31.48.672.1	31.49.672.1	31.92.657.1
350*150		31.62.563.1	31.63.564.1	31.93.566.1	600*400		31.48.707.1	31.49.707.1	31.92.707.1
350*200		31.62.622.1	31.63.618.1	31.93.618.1	600*450		31.48.757.1	31.49.757.1	31.92.757.1
350*250		31.62.665.1	31.63.665.1	31.93.665.1	600*500		31.48.807.1	31.49.807.1	31.92.807.1
350*300		31.62.710.1	31.63.710.1	31.93.710.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-600	072.1	341.1
20	40-600	078.1	343.1
25	40-100	080.1	345.1
	150-600	084.1	346.1
40	50-100	086.1	350.1
	150-600	088.1	351.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.122.1			230 76.83.37.501.1
813	76.80.60.124.1			255 76.83.37.502.1
1219	76.80.60.126.1			305 76.83.37.503.1
1524	76.80.60.128.1			355 76.83.37.505.1
1829	76.80.60.130.1			405 76.83.37.506.1
2134	76.80.60.132.1			455 76.83.37.507.1
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
20	4	3/4	*	120	61.332.1	20	4	3/4	*	120
25	4	7/8	*	130	61.403.1	25	4	7/8	*	130
40	4	1	*	140	61.469.1	40	4	1	*	140
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					
450	16	2 3/4	*	580	83.779.1					
500	16	3	*	640	83.855.1					
600	16	3 1/2	*	730	83.934.1					

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	3/8	*	280	61.652.1		150	12	3/8	*	300	61.655.1
200	12	5/8	*	360	61.736.1		200	12	5/8	*	400	61.741.1
250	12	7/8	*	420	61.802.1		250	12	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
450	16	2 3/4	*	600	83.781.1		450	16	2 3/4	*	680	83.789.1
500	16	3	*	660	83.857.1		500	16	3	*	750	83.866.1
600	16	3 1/2	*	750	83.936.1		600	16	3 1/2	*	860	83.945.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	61.417.1
80	8	1 1/8	* 270	61.558.1
100	8	1 1/4	* 300	61.610.1
150	12	3/8	* 430	61.671.1
200	12	5/8	* 560	83.357.1
250	12	7/8	* 640	83.505.1
300	16		* 740	83.585.1
350	16	1 1/4	* 830	83.663.1
400	16	1 1/2	* 890	83.737.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.80.032.1

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```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.464.1
WELDING NECK FLANGE    1  76.62.80.034.1

```

* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.62.10.412.1	
GASKET, SPIRAL WOUND	2	85.41.146.506.1	
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1	

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.80.032.1
```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1   85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1   77.85.47.063.1
WELDING NECK FLANGE               1   76.62.80.032.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1    76.62.80.032.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

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* 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      76.83.37.501.1

```

```

* 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   76.62.60.537.1
GASKET, SPIRAL WOUND              1   85.41.46.512.1
STUD BOLT WITH NUTS               4   81.38.61.472.1
THERMOWELL TAPERED                1   76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE         1  76.62.80.032.1

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```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.80.034.1

```

* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	

CLASS 151440

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

PRESSURE BAR GA
DN15 -600 222.3 222.3

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
 - 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
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	XXS
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	B	A	20	XXS
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	XXS
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	XXS
350	C	C	C	C	E	E	E	B	B	B	B	A					50	XXS
300	C	C	C	C	E	E	E	B	B	B	A						80	XXS
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	160
100	C	C	C	B	B	B	A										250	160
80	C	C	C	B	B	A											300	160
50	C	B	B	B	A												350	160
40	B	B	B	A													400	160
25	B	B	A														450	160
20	B	A															500	160
15	A																600	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. : 151440	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 151440, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A106-B
		DN250-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* 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 80-200	ASTM A105
		DN250-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 151440, REV.A PAGE 3
ISSUE DATE : DECEMBER 1998

		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	022.1	032.1	042.1	062.1	075.1	115.1	161.1	227.1	267.1							
	74.30.16										113.1	125.1	138.1	147.1	182.1	222.1	252.1
* 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	438.1	440.1	444.1
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	188.1	190.1	192.1
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	188.1	190.1	192.1
WELDING NECK FLANGE	76.62.79							974.1	976.1	978.1	980.1	982.1	984.1	986.1	988.1	990.1	994.1
	76.62.80	032.1	034.1	036.1	038.1	040.1	044.1										
* FITTINGS																	
CAP BUTT-WELD.END	76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1							
	76.31.17										315.1	337.1	357.1	377.1	393.1	403.1	414.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1							
	76.31.34										315.1	337.1	357.1	377.1	392.1	402.1	412.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1							
	76.31.43										315.1	337.1	357.1	377.1	392.1	402.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1							
	76.31.80										315.1	337.1	357.1	377.1	392.1	402.1	412.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.73					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1			
BALL VALVE RED. BORE TRUN FLGD	77.00.73					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1			
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1												
	77.10.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1												
	77.30.23					208.1	210.1	212.1									
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1											
* 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	536.1	538.1	542.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					140.1	144.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1	988.1	990.1	994.1

	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	79.07.374.1			
25* 15		30.66.152.1	30.67.152.1	30.88.050.1	400* 80	79.07.404.1			
25* 20		30.66.162.1	30.67.162.1	30.88.060.1	400*100	79.07.240.1			
40* 15		30.66.172.1	30.67.172.1	30.88.070.1	400*150	79.07.260.1	29.45.744.1	29.60.744.1	31.88.466.1
40* 20		30.66.182.1	30.67.182.1	30.88.080.1	400*200	79.07.278.1	31.66.459.1	31.75.459.1	31.88.484.1
40* 25		30.66.192.1	30.67.192.1	30.88.090.1	400*250	79.07.294.1	31.66.468.1	31.75.468.1	31.88.510.1
50* 20		30.66.195.1	30.67.195.1	30.88.099.1	400*300	79.07.308.1	31.66.480.1	31.75.480.1	31.88.536.1
50* 25		30.66.202.1	30.67.202.1	30.88.108.1	400*350	79.07.320.1	31.66.491.1	31.75.491.1	31.88.561.1
50* 40		30.66.212.1	30.67.212.1	30.88.117.1	450*100	79.07.242.1			
80* 40		30.66.232.1	30.67.232.1	30.88.126.1	450*150	79.07.262.1			
80* 50	79.03.680.1	30.66.242.1	30.67.242.1	30.88.135.1	450*200	79.07.280.1	31.66.508.1	31.75.508.1	31.88.585.1
100* 40		30.66.257.1	30.67.257.1	30.88.151.1	450*250	79.07.296.1	31.66.530.1	31.75.530.1	31.88.609.1
100* 50		30.66.274.1	30.67.274.1	30.88.163.1	450*300	79.07.310.1	31.66.560.1	31.75.560.1	31.88.633.1
100* 80		30.66.284.1	30.67.284.1	30.88.175.1	450*350	79.07.322.1	31.66.591.1	31.75.591.1	31.88.657.1
150* 50	79.03.102.1				450*400		31.66.621.1	31.75.621.1	31.88.681.1
150* 80		30.66.294.1	30.67.294.1	30.88.187.1	500*100	79.07.244.1			
150*100	79.03.230.1	30.66.311.1	30.67.311.1	30.88.192.1	500*150	79.07.264.1			
200* 50	79.03.103.1				500*200	79.07.282.1	29.45.907.1	29.60.907.1	31.88.705.1
200* 80	79.03.116.1				500*250	79.07.298.1	29.45.940.1	29.60.941.1	31.88.729.1
200*100	79.03.232.1	30.66.331.1	30.67.331.1	30.88.208.1	500*300	79.07.312.1	31.66.650.1	31.75.650.1	31.88.753.1
200*150	79.03.252.1	30.66.341.1	30.67.341.1	30.88.228.1	500*350	79.07.324.1	31.66.681.1	31.75.681.1	31.88.777.1
250* 50	79.07.368.1				500*400		31.66.711.1	31.75.711.1	31.88.801.1
250* 80	79.07.398.1				500*450		31.66.741.1	31.75.741.1	31.88.825.1
250*100	79.07.234.1	31.66.349.1	31.75.349.1	31.88.256.1	600*100	79.07.248.1			
250*150	79.07.254.1	31.66.360.1	31.75.349.1	31.88.274.1	600*150	79.07.268.1			
250*200	79.07.272.1	31.66.370.1	31.75.370.1	31.88.296.1	600*200	79.07.286.1			
300* 50	79.07.370.1				600*250	79.07.302.1	31.66.808.1	31.75.808.1	31.88.849.1
300* 80	79.07.400.1				600*300	79.07.316.1	31.66.828.1	31.75.828.1	31.88.873.1
300*100	79.07.236.1				600*350	79.07.328.1	31.66.848.1	31.75.848.1	31.88.897.1
300*150	79.07.256.1	31.66.389.1	31.75.389.1	31.88.313.1	600*400		31.66.891.1	31.75.891.1	31.88.921.1
300*200	79.07.274.1	31.66.400.1	31.75.400.1	31.88.333.1	600*450		31.66.921.1	31.75.921.1	31.88.945.1
300*250	79.07.290.1	31.66.410.1	31.75.410.1	31.88.355.1	600*500		31.66.951.1	31.75.951.1	31.88.969.1
350* 50	79.07.372.1								
350* 80	79.07.402.1								
350*100	79.07.238.1								
350*150	79.07.258.1	31.66.419.1	31.75.419.1	31.88.376.1					
350*200	79.07.276.1	31.66.428.1	31.75.428.1	31.88.395.1					
350*250	79.07.292.1	31.66.441.1	31.75.441.1	31.88.420.1					
350*300	79.07.306.1	31.66.451.1	31.75.451.1	31.88.446.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-600	072.1	341.1
20	40-600	078.1	343.1
25	40-100	080.1	345.1
	150-600	084.1	346.1
40	50-100	086.1	350.1
	150-600	088.1	351.1
LEVEL	DISPLACER	CHAMBER	
LENGTH	MESCNUMBER		THERMOWELL
-----	-----		LENGTH
			MESCNUMBER
356	76.80.60.482.1		230
813	76.80.60.484.1		255
1219	76.80.60.486.1		305
1524	76.80.60.488.1		355
1829	76.80.60.490.1		405
2134	76.80.60.492.1		455
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

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
20	4	3/4	*	120	66.332.1	20	4	3/4	*	120
25	4	7/8	*	130	66.403.1	25	4	7/8	*	130
40	4	1	*	140	66.469.1	40	4	1	*	140
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					
450	16	2 3/4	*	580	86.779.1					
500	16	3	*	640	86.855.1					
600	16	3 1/2	*	730	86.934.1					

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	3/8	*	280	66.652.1		150	12	3/8	*	300	66.655.1
200	12	5/8	*	360	66.736.1		200	12	5/8	*	400	66.741.1
250	12	7/8	*	420	66.802.1		250	12	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
450	16	2 3/4	*	600	86.781.1		450	16	2 3/4	*	680	86.789.1
500	16	3	*	660	86.857.1		500	16	3	*	750	86.866.1
600	16	3 1/2	*	750	86.936.1		600	16	3 1/2	*	860	86.945.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	7/8	* 220	66.417.1
80	8	1 1/8	* 270	66.550.1
100	8	1 1/4	* 300	66.610.1
150	12	1 3/8	* 430	66.671.1
200	12	1 5/8	* 560	86.357.1
250	12	1 7/8	* 640	86.505.1
300	16	2	* 740	86.585.1
350	16	2 1/4	* 830	86.663.1
400	16	2 1/2	* 890	86.737.1

ASSEMBLIES

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* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.80.032.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.464.1
WELDING NECK FLANGE    1  76.62.80.034.1

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* DRAIN POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1	

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2    77.85.47.063.1
WELDING NECK FLANGE       2    76.62.80.032.1
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```
* PI ON PIPING CL COUP   DN 15   FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1   85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE      1  76.62.80.032.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE        1  76.62.80.032.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

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* 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                   1  76.83.37.501.1
                                L=230 MM

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* 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   76.62.60.537.1
GASKET, SPIRAL WOUND                 1   85.41.46.512.1
STUD BOLT WITH NUTS                  4   81.38.66.472.1
THERMOWELL TAPERED                   1   76.83.37.502.1
                                L=255 MM

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.043.1
WELDING NECK FLANGE        1  76.62.80.032.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.80.034.1

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* VENT POINT	DN 20	FIG.DE	DN 50 -600
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	

CLASS 151441

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

PRESSURE BAR GA
DN15 -600 222.3 222.3

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	B	A	15	XXS
500	C	C	C	C	E	E	E	E	E	E	B	B	B	B	B	A	20	XXS
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A		25	XXS
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	XXS
350	C	C	C	C	E	E	E	B	B	B	B	A					50	XXS
300	C	C	C	C	E	E	E	B	B	B	A						80	XXS
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	160
100	C	C	C	B	B	B	A										250	160
80	C	C	C	B	B	A											300	160
50	C	B	B	B	A												350	160
40	B	B	B	A													400	160
25	B	B	A														450	160
20	B	A															500	160
15	A																600	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. : 151441	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 151441, REV.O PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A106-B
		DN250-600	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-600	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* 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 80-200	ASTM A105
		DN250-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-600	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 151441, REV.O PAGE 3
ISSUE DATE : DECEMBER 1998

		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	022.1	032.1	042.1	062.1	075.1	115.1	161.1	227.1	267.1							
	74.30.16										113.1	125.1	138.1	147.1	182.1	222.1	252.1
* 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	438.1	440.1	444.1
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	188.1	190.1	192.1
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	188.1	190.1	192.1
WELDING NECK FLANGE	76.62.79							974.1	976.1	978.1	980.1	982.1	984.1	986.1	988.1	990.1	994.1
	76.62.80	032.1	034.1	036.1	038.1	040.1	044.1										
* FITTINGS																	
CAP BUTT-WELD.END	76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1							
	76.31.17										315.1	337.1	357.1	377.1	393.1	403.1	414.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1							
	76.31.34										315.1	337.1	357.1	377.1	392.1	402.1	412.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1							
	76.31.43										315.1	337.1	357.1	377.1	392.1	402.1	412.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1							
	76.31.80										315.1	337.1	357.1	377.1	392.1	402.1	412.1
* VALVES																	
BALL VALVE FULL BORE TRUN FLGD	77.00.91					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1			
BALL VALVE RED. BORE TRUN FLGD	77.00.91					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1			
CHECK VALVE FLANGED	77.10.43	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	220.1	221.1	223.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.57					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GATE VALVE FLANGED	77.20.53	203.1	204.1	205.1	207.1												
GLOBE VALVE FLANGED	77.30.53	203.1	204.1	205.1	207.1	208.1	210.1	212.1									
MONOFL SINGLE BLOCK BALL	77.00.97	463.1	464.1	465.1	467.1	468.1											
* 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	536.1	538.1	542.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					140.1	144.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1	988.1	990.1	994.1

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	79.07.374.1		
25* 15	30.66.152.1	30.67.152.1	30.88.050.1	400* 80	79.07.404.1		
25* 20	30.66.162.1	30.67.162.1	30.88.060.1	400*100	79.07.240.1		
40* 15	30.66.172.1	30.67.172.1	30.88.070.1	400*150	79.07.260.1	29.45.744.1	29.60.744.1 31.88.466.1
40* 20	30.66.182.1	30.67.182.1	30.88.080.1	400*200	79.07.278.1	31.66.459.1	31.75.459.1 31.88.484.1
40* 25	30.66.192.1	30.67.192.1	30.88.090.1	400*250	79.07.294.1	31.66.468.1	31.75.468.1 31.88.510.1
50* 20	30.66.195.1	30.67.195.1	30.88.099.1	400*300	79.07.308.1	31.66.480.1	31.75.480.1 31.88.536.1
50* 25	30.66.202.1	30.67.202.1	30.88.108.1	400*350	79.07.320.1	31.66.491.1	31.75.491.1 31.88.561.1
50* 40	30.66.212.1	30.67.212.1	30.88.117.1	450*100	79.07.242.1		
80* 40	30.66.232.1	30.67.232.1	30.88.126.1	450*150	79.07.262.1		
80* 50	79.03.680.1	30.66.242.1	30.67.242.1	30.88.135.1	450*200	79.07.280.1	31.66.508.1 31.75.508.1 31.88.585.1
100* 40		30.66.257.1	30.67.257.1	30.88.151.1	450*250	79.07.296.1	31.66.530.1 31.75.530.1 31.88.609.1
100* 50		30.66.274.1	30.67.274.1	30.88.163.1	450*300	79.07.310.1	31.66.560.1 31.75.560.1 31.88.633.1
100* 80		30.66.284.1	30.67.284.1	30.88.175.1	450*350	79.07.322.1	31.66.591.1 31.75.591.1 31.88.657.1
150* 50	79.03.102.1			450*400		31.66.621.1	31.75.621.1 31.88.681.1
150* 80		30.66.294.1	30.67.294.1	30.88.187.1	500*100	79.07.244.1	
150*100	79.03.230.1	30.66.311.1	30.67.311.1	30.88.192.1	500*150	79.07.264.1	
200* 50	79.03.103.1			500*200	79.07.282.1	29.45.907.1	29.60.907.1 31.88.705.1
200* 80	79.03.116.1			500*250	79.07.298.1	29.45.940.1	29.60.941.1 31.88.729.1
200*100	79.03.232.1	30.66.331.1	30.67.331.1	500*300	79.07.312.1	31.66.650.1	31.75.650.1 31.88.753.1
200*150	79.03.252.1	30.66.341.1	30.67.341.1	500*350	79.07.324.1	31.66.681.1	31.75.681.1 31.88.777.1
250* 50	79.07.368.1			500*400		31.66.711.1	31.75.711.1 31.88.801.1
250* 80	79.07.398.1			500*450		31.66.741.1	31.75.741.1 31.88.825.1
250*100	79.07.234.1	31.66.349.1	31.75.349.1	600*100	79.07.248.1		
250*150	79.07.254.1	31.66.360.1	31.75.349.1	600*150	79.07.268.1		
250*200	79.07.272.1	31.66.370.1	31.75.370.1	600*200	79.07.286.1		
300* 50	79.07.370.1			600*250	79.07.302.1	31.66.808.1	31.75.808.1 31.88.849.1
300* 80	79.07.400.1			600*300	79.07.316.1	31.66.828.1	31.75.828.1 31.88.873.1
300*100	79.07.236.1			600*350	79.07.328.1	31.66.848.1	31.75.848.1 31.88.897.1
300*150	79.07.256.1	31.66.389.1	31.75.389.1	600*400		31.66.891.1	31.75.891.1 31.88.921.1
300*200	79.07.274.1	31.66.400.1	31.75.400.1	600*450		31.66.921.1	31.75.921.1 31.88.945.1
300*250	79.07.290.1	31.66.410.1	31.75.410.1	600*500		31.66.951.1	31.75.951.1 31.88.969.1
350* 50	79.07.372.1						
350* 80	79.07.402.1						
350*100	79.07.238.1						
350*150	79.07.258.1	31.66.419.1	31.75.419.1	31.88.376.1			
350*200	79.07.276.1	31.66.428.1	31.75.428.1	31.88.395.1			
350*250	79.07.292.1	31.66.441.1	31.75.441.1	31.88.420.1			
350*300	79.07.306.1	31.66.451.1	31.75.451.1	31.88.446.1			

BRANCH	RUN-PIPE	BNIB	BNIF
		76.80.31	76.80.37
15	40-600	072.1	341.1
20	40-600	078.1	343.1
25	40-100	080.1	345.1
	150-600	084.1	346.1
40	50-100	086.1	350.1
	150-600	088.1	351.1
LEVEL	DISPLACER	CHAMBER	THERMOWELL
LENGTH	MESCNUMBER		LENGTH MESCNUMBER
-----	-----		-----
356	76.80.60.482.1		230 76.83.37.501.1
813	76.80.60.484.1		255 76.83.37.502.1
1219	76.80.60.486.1		305 76.83.37.503.1
1524	76.80.60.488.1		355 76.83.37.505.1
1829	76.80.60.490.1		405 76.83.37.506.1
2134	76.80.60.492.1		455 76.83.37.507.1
2438	76.80.60.494.1		
2743	76.80.60.496.1		
3048	76.80.60.498.1		

COMP.	DESCRIPTION
NAME	-----
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
20	4	3/4	*	120	66.332.1	20	4	3/4	*	120
25	4	7/8	*	130	66.403.1	25	4	7/8	*	130
40	4	1	*	140	66.469.1	40	4	1	*	140
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					
450	16	2 3/4	*	580	86.779.1					
500	16	3	*	640	86.855.1					
600	16	3 1/2	*	730	86.934.1					

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	3/8	*	280	66.652.1		150	12	3/8	*	300	66.655.1
200	12	5/8	*	360	66.736.1		200	12	5/8	*	400	66.741.1
250	12	7/8	*	420	66.802.1		250	12	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
450	16	2 3/4	*	600	86.781.1		450	16	2 3/4	*	680	86.789.1
500	16	3	*	660	86.857.1		500	16	3	*	750	86.866.1
600	16	3 1/2	*	750	86.936.1		600	16	3 1/2	*	860	86.945.1

BOLTSET WAFER CHECK VALVE

81.38					
DN	NR	INCH	*	MM	
50	8	7/8	*	220	66.417.1
80	8	1 1/8	*	270	66.550.1
100	8	1 1/4	*	300	66.610.1
150	12	3/8	*	430	66.671.1
200	12	5/8	*	560	86.357.1
250	12	7/8	*	640	86.505.1
300	16		*	740	86.585.1
350	16	1 1/4	*	830	86.663.1
400	16	1 1/2	*	890	86.737.1

ASSEMBLIES

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* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.463.1
WELDING NECK FLANGE    1  76.62.80.032.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.464.1
WELDING NECK FLANGE    1  76.62.80.034.1

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* DRAIN POINT          DN 20 FIG.DE   DN 50 -600
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
MONOFL SINGLE BLOCK BALL 1  77.00.97.464.1

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* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.363.1
WELDING NECK FLANGE        2  76.62.80.032.1

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```
* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1   85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1   77.85.47.363.1
WELDING NECK FLANGE               1   76.62.80.032.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.363.1

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* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
WELDING NECK FLANGE       1      76.62.80.032.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1

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* 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      76.83.37.501.1

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* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -6000
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                   1   76.83.37.502.1
                                L=255 MM

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* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.92.043.1
WELDING NECK FLANGE         1  76.62.80.032.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.92.044.1
WELDING NECK FLANGE         1  76.62.80.034.1

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* VENT POINT                DN 20  FIG.DE   DN 50 -600
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
MONOFL SINGLE BLOCK NEEDLE 1   77.30.92.044.1

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CLASS 151450

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS						
	0	50	75	100	120	150	200

	PRESSURE BAR GA						
DN15 -600	254.2	250.4	240.2	231.9	229.5	226.0	219.1

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - 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																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	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	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	B	B	B	B	A					50	160
300	C	C	C	C	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	160
100	C	C	C	B	B	B	A										250	160
80	C	C	C	B	B	A											300	160
50	C	B	B	B	A												350	38.0
40	B	B	B	A													400	42.0
25	B	B	A														450	46.0
20	B	A															500	52.0
15	A																600	62.0

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.

CARBON STEEL	PLANT	:	
CLASS NO. : 151450	CONSIGNEE	:	
ANS RATING : CLASS 1500	ENGINEERED BY	:	
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 07/97	PROJECT NO.	:	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-300	ASTM A106-B
		DN350-600	ASTM A333-6

* 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 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* 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
		DN250-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			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: AISI 316,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
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 15-600	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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-300	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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ISSUE DATE : DECEMBER 1998

		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	073.1	113.1	161.1	227.1	267.1	309.1	349.1					
	74.30.14												290.1	350.1	420.1	500.1	580.1
* 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	438.1	440.1	444.1
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	188.1	190.1	192.1
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	188.1	190.1	192.1
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					
	76.62.84												290.1	350.1	420.1	500.1	580.1
* 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							
	76.31.15												290.1	350.1	420.1	500.1	580.1
	76.31.18										315.1	337.1					
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							
	76.31.38										315.1	337.1					
	76.31.44												290.1	350.1	410.1	460.1	530.1
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							
	76.31.39										315.1	337.1					
	76.31.46												290.1	350.1	420.1	500.1	580.1
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							
	76.31.84										315.1	337.1					
	76.31.90												290.1	350.1	420.1	500.1	580.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1												
	77.10.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1												
	77.20.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1												
	77.30.23					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	536.1	538.1	542.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					970.1	972.1	974.1	976.1	978.1	980.1	982.1					

	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	79.09.250.1			
25* 15		30.72.151.1	30.73.151.1	30.89.049.1	400* 80	79.09.520.1			
25* 20		30.72.161.1	30.73.161.1	30.89.059.1	400*100	79.09.754.1			
40* 15		30.72.171.1	30.73.171.1	30.89.069.1	400*150	79.09.785.1	31.62.759.1	31.63.756.1	31.93.750.1
40* 20		30.72.181.1	30.73.181.1	30.89.079.1	400*200		31.62.805.1	31.63.809.1	31.93.801.1
40* 25		30.72.191.1	30.73.191.1	30.89.089.1	400*250		31.62.854.1	31.63.855.1	31.93.850.1
50* 20		29.46.195.1	29.61.195.1	30.89.098.1	400*300		31.62.900.1	31.63.900.1	31.93.900.1
50* 25		30.72.201.1	30.73.201.1	30.89.107.1	400*350		31.62.951.1	31.63.951.1	31.93.951.1
50* 40		30.72.211.1	30.73.211.1	30.89.116.1	450* 50	79.09.266.1			
80* 40		30.72.231.1	30.73.231.1	30.89.125.1	450* 80	79.09.550.1			
80* 50	79.03.180.1	30.72.241.1	30.73.241.1	30.89.134.1	450*100	79.09.759.1			
100* 40		30.72.259.1	30.73.259.1	30.89.143.1	450*150	79.09.815.1			
100* 50	79.03.182.1	30.72.271.1	30.73.271.1	30.89.155.1	450*200		31.48.030.1	31.49.030.1	31.92.010.1
100* 80	79.03.206.1	30.72.281.1	30.73.281.1	30.89.167.1	450*250		31.48.050.1	31.49.050.1	31.92.050.1
150* 50	79.03.184.1				450*300		31.48.100.1	31.49.100.1	31.92.100.1
150* 80	79.03.208.1	30.72.301.1	30.73.301.1	30.89.179.1	450*350		31.48.151.1	31.49.151.1	31.92.151.1
150*100	79.03.230.1	30.72.311.1	30.73.311.1	30.89.192.1	450*400		31.48.201.1	31.49.201.1	31.92.201.1
200* 50	79.03.186.1				500* 50	79.09.276.1			
200* 80	79.03.210.1				500* 80	79.09.570.1			
200*100	79.03.232.1	30.72.331.1	30.73.331.1	30.89.208.1	500*100	79.09.764.1			
200*150	79.03.252.1	30.72.341.1	30.73.341.1	30.89.228.1	500*150	79.09.845.1			
250* 50	79.07.188.1				500*200	79.09.915.1	31.48.290.1	31.49.290.1	31.92.250.1
250* 80	79.07.212.1				500*250		31.48.320.1	31.49.320.1	31.92.300.1
250*100	79.07.234.1	31.70.349.1	31.71.349.1	31.85.256.1	500*300		31.48.350.1	31.49.501.1	31.92.350.1
250*150	79.07.254.1	31.70.360.1	31.71.360.1	31.85.274.1	500*350		31.48.401.1	31.49.401.1	31.92.401.1
250*200	79.07.272.1	31.70.370.1	31.71.370.1	31.85.296.1	500*400		31.48.451.1	31.49.451.1	31.92.451.1
300* 50	79.07.190.1				500*450		31.48.501.1	31.49.501.1	31.92.501.1
300* 80	79.07.214.1				600* 50	79.09.294.1			
300*100	79.07.236.1				600* 80	79.09.590.1			
300*150	79.07.256.1	31.70.389.1	31.71.389.1	31.85.313.1	600*100	79.09.768.1			
300*200	79.07.274.1	31.70.400.1	31.71.400.1	31.85.333.1	600*150	79.09.875.1			
300*250	79.07.290.1	31.70.410.1	31.71.410.1	31.85.355.1	600*200	79.09.945.1			
350* 50	79.09.220.1				600*250	79.09.970.1	31.48.620.1	31.49.620.1	
350* 80	79.09.470.1				600*300		31.48.650.1	31.49.650.1	31.92.600.1
350*100	79.09.725.1				600*350		31.48.670.1	31.49.670.1	31.92.651.1
350*150		31.62.558.1	31.63.663.1	31.93.562.1	600*400		31.48.701.1	31.49.701.1	31.92.701.1
350*200		31.62.613.1	31.63.614.1	31.93.562.1	600*450		31.48.751.1	31.49.751.1	31.92.751.1
350*250		31.62.660.1	31.63.660.1	31.93.614.1	600*500		31.48.801.1	31.49.801.1	31.92.801.1
350*300		31.62.705.1	31.63.705.1	31.93.661.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-600	321.1	016.1
20	40-600	323.1	018.1
25	40-100	325.1	020.1
	150-600	326.1	024.1
40	50-100	330.1	026.1
	150-600	331.1	028.1
50	80-100	336.1	
	150-250	337.1	
	300-600	338.1	

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.60.122.1		230	76.83.37.501.1
813	76.80.60.124.1		255	76.83.37.502.1
1219	76.80.60.126.1		305	76.83.37.503.1
1524	76.80.60.128.1		355	76.83.37.505.1
1829	76.80.60.130.1		405	76.83.37.506.1
2134	76.80.60.132.1		455	76.83.37.507.1
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

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ISSUE DATE : DECEMBER 1998

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* 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
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* 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                   1   76.83.37.501.1
                                L=230 MM

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* 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  76.62.60.537.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                  4  81.38.61.472.1
THERMOWELL TAPERED                   1  76.83.37.502.1
                                L=255 MM

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* VENT POINT          DN 15  FIG.11  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

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* 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

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* VENT POINT                DN 20  FIG.1H  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.62.10.412.1
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

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CLASS 151460

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 150 200

PRESSURE BAR GA
DN15 -600 222.3 222.3 218.8

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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	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	B	B	B	B	B	B	A		25	160
400	C	C	C	C	E	E	E	E	B	B	B	B	A				40	160
350	C	C	C	C	E	E	E	E	B	B	B	B	A				50	160
300	C	C	C	C	E	E	E	E	B	B	B	B	A				80	160
250	C	C	C	C	E	E	E	E	B	B	B	A					100	160
200	C	C	C	C	E	E	E	B	B	B	A						150	160
150	C	C	C	C	E	B	B	B	A								200	160
100	C	C	C	C	B	B	B	A									250	160
80	C	C	C	B	B	B	A										300	160
50	C	B	B	B	B	A											350	160
40	B	B	B	B	A												400	160
25	B	B	A														450	160
20	B	A															500	160
15	A																600	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. : 151460	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A106-B
		DN250-600	ASTM A333-6

* 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 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* 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
		DN250-600	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-600	ASTM A420-WPL6

* VALVES

CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			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: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-600	TRIM: AISI 316(L),STELLITE 6
			BODY: ASTM A216-WCB/WCC,A105
			TRIM: AISI 410
GLVF	GLOBE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105
		DN 50-100	TRIM: AISI 316(L),STELLITE 6
			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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-600	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 151460, REV.A PAGE 3
ISSUE DATE : DECEMBER 1998

		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	073.1	113.1	161.1	227.1	267.1							
	74.30.16										113.1	125.1	138.1	147.1	182.1	222.1	252.1
* 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	438.1	440.1	444.1
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	188.1	190.1	192.1
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	188.1	190.1	192.1
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	988.1	990.1	994.1
* 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							
	76.31.17										315.1	337.1	357.1	377.1	393.1	403.1	414.1
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							
	76.31.34										315.1	337.1	357.1	377.1	392.1	402.1	412.1
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							
	76.31.43										315.1	337.1	357.1	377.1	392.1	402.1	412.1
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							
	76.31.80										315.1	337.1	357.1	377.1	392.1	402.1	412.1
* VALVES																	
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1												
	77.10.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GATE VALVE FLANGED	77.20.04	203.1	204.1	205.1	207.1												
	77.20.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1	223.1
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1												
	77.30.23					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	536.1	538.1	542.1
METER RUN	76.64.96	082.1	084.1	086.1	088.1												
ORIFICE FLANGE SET	76.62.95					970.1	972.1	974.1	976.1	978.1	980.1	982.1	984.1	986.1	988.1	990.1	994.1

	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	79.07.194.1			
25* 15		30.66.151.1	30.67.151.1	30.88.049.1	400* 80	79.07.218.1			
25* 20		30.66.161.1	30.67.161.1	30.88.059.1	400*100	79.07.240.1			
40* 15		30.66.171.1	30.67.171.1	30.88.069.1	400*150	79.07.260.1	29.45.744.1	29.60.744.1	31.88.466.1
40* 20		30.66.181.1	30.67.181.1	30.88.079.1	400*200	79.07.278.1	31.66.459.1	31.75.459.1	31.88.484.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1	400*250	79.07.294.1	31.66.468.1	31.75.468.1	31.88.510.1
50* 20		30.66.195.1	30.67.195.1	30.88.098.1	400*300	79.07.308.1	31.66.480.1	31.75.480.1	31.88.536.1
50* 25		30.66.201.1	30.67.201.1	30.88.107.1	400*350	79.07.320.1	31.66.491.1	31.75.491.1	31.88.561.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1	450* 50	79.07.196.1			
80* 40		30.66.231.1	30.67.231.1	30.88.125.1	450* 80	79.07.220.1			
80* 50	79.03.180.1	30.66.241.1	30.67.241.1	30.88.134.1	450*100	79.07.242.1			
100* 40		30.66.259.1	30.67.259.1	30.88.143.1	450*150	79.07.262.1			
100* 50	79.03.182.1	30.66.271.1	30.67.271.1	30.88.155.1	450*200	79.07.280.1	31.66.508.1	31.75.508.1	31.88.585.1
100* 80	79.03.206.1	30.66.281.1	30.67.281.1	30.88.167.1	450*250	79.07.296.1	31.66.530.1	31.75.530.1	31.88.609.1
150* 50	79.03.184.1				450*300	79.07.310.1	31.66.560.1	31.75.560.1	31.88.633.1
150* 80	79.03.208.1	30.66.301.1	30.67.301.1	30.88.179.1	450*350	79.07.322.1	31.66.591.1	31.75.591.1	31.88.657.1
150*100	79.03.230.1	30.66.311.1	30.67.311.1	30.88.192.1	450*400		31.66.621.1	31.75.621.1	31.88.681.1
200* 50	79.03.186.1				500* 50	79.07.198.1			
200* 80	79.03.210.1				500* 80	79.07.222.1			
200*100	79.03.232.1	30.66.331.1	30.67.331.1	30.88.208.1	500*100	79.07.244.1			
200*150	79.03.252.1	30.66.341.1	30.67.341.1	30.88.228.1	500*150	79.07.264.1			
250* 50	79.07.188.1				500*200	79.07.282.1	29.45.907.1	29.60.907.1	31.88.705.1
250* 80	79.07.212.1				500*250	79.07.298.1	29.45.940.1	29.60.941.1	31.88.729.1
250*100	79.07.234.1	31.66.349.1	31.75.349.1	31.88.256.1	500*300	79.07.312.1	31.66.650.1	31.75.650.1	31.88.753.1
250*150	79.07.254.1	31.66.360.1	31.75.349.1	31.88.274.1	500*350	79.07.324.1	31.66.681.1	31.75.681.1	31.88.777.1
250*200	79.07.272.1	31.66.370.1	31.75.370.1	31.88.296.1	500*400		31.66.711.1	31.75.711.1	31.88.801.1
300* 50	79.07.190.1				500*450		31.66.741.1	31.75.741.1	31.88.825.1
300* 80	79.07.214.1				600* 50	79.07.202.1			
300*100	79.07.236.1				600* 80	79.07.226.1			
300*150	79.07.256.1	31.66.389.1	31.75.389.1	31.88.313.1	600*100	79.07.248.1			
300*200	79.07.274.1	31.66.400.1	31.75.400.1	31.88.333.1	600*150	79.07.268.1			
300*250	79.07.290.1	31.66.410.1	31.75.410.1	31.88.355.1	600*200	79.07.286.1			
350* 50	79.07.192.1				600*250	79.07.302.1	31.66.808.1	31.75.808.1	31.88.849.1
350* 80	79.07.216.1				600*300	79.07.316.1	31.66.828.1	31.75.828.1	31.88.873.1
350*100	79.07.238.1				600*350	79.07.328.1	31.66.848.1	31.75.848.1	31.88.897.1
350*150	79.07.258.1	31.66.419.1	31.75.419.1	31.88.376.1	600*400		31.66.891.1	31.75.891.1	31.88.921.1
350*200	79.07.276.1	31.66.428.1	31.75.428.1	31.88.395.1	600*450		31.66.921.1	31.75.921.1	31.88.945.1
350*250	79.07.292.1	31.66.441.1	31.75.441.1	31.88.420.1	600*500		31.66.951.1	31.75.951.1	31.88.969.1
350*300	79.07.306.1	31.66.451.1	31.75.451.1	31.88.446.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE	-----	
15	40-600	321.1	016.1
20	40-600	323.1	018.1
25	40-100	325.1	020.1
	150-600	326.1	024.1
40	50-100	330.1	026.1
	150-600	331.1	028.1
50	80-100	336.1	
	150-250	337.1	
	300-600	338.1	

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.482.1		230	76.83.37.501.1
813	76.80.60.484.1		255	76.83.37.502.1
1219	76.80.60.486.1		305	76.83.37.503.1
1524	76.80.60.488.1		355	76.83.37.505.1
1829	76.80.60.490.1		405	76.83.37.506.1
2134	76.80.60.492.1		455	76.83.37.507.1
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	1/8	* 180	66.533.1							
100	8	1/4	* 200	66.588.1							
150	12	3/8	* 260	66.649.1							
200	12	5/8	* 350	66.734.1							
250	12	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							
450	16	2 3/4	* 580	86.779.1							
500	16	3	* 640	86.855.1							
600	16	3 1/2	* 730	86.934.1							

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	3/8	*	280	66.652.1		150	12	3/8	*	300	66.655.1
200	12	5/8	*	360	66.736.1		200	12	5/8	*	400	66.741.1
250	12	7/8	*	420	66.802.1		250	12	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
450	16	3	*	600	86.781.1		450	16	3	*	680	86.789.1
500	16	3	*	660	86.857.1		500	16	3	*	750	86.866.1
600	16	3 1/2	*	750	86.936.1		600	16	3 1/2	*	860	86.945.1

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	7/8	* 220	66.417.1
80	8	1/8	* 270	66.550.1
100	8	1/4	* 300	66.610.1
150	12	3/8	* 430	66.671.1
200	12	5/8	* 560	86.357.1
250	12	7/8	* 640	86.505.1
300	16	2	* 740	86.585.1
350	16	2 1/4	* 830	86.663.1
400	16	2 1/2	* 890	86.737.1

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

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* DRAIN POINT                DN 20  FIG.OI  DN 40 - 40
Branch: (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

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* DRAIN POINT	DN 20	FIG.OI	DN 50 -600
Branch:S (:=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	

```

* ORIFICE INTR.CONN.      DN 15  FIG.0I  DN 50 -600
Branch: (N=br.tab;S=BNIF;=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      4  85.41.46.504.1
GATE VALVE FLANGED        2  77.20.4.203.1
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

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* PRESSURE INSTR.CONN.      DN 15  FIG.OI  DN 15 - 40
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
                             4  81.38.66.330.1
WELDING NECK FLANGE         1  76.62.79.962.1

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* PRESSURE INSTR.CONN.      DN 15  FIG.OI  DN 50 -600
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
WELDING NECK FLANGE         1  76.62.79.962.1

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* METERRUN INSTR. CONN      DN 15  FIG.0H  DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,:=N/A) 1(P1PING 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

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* 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                   1  76.83.37.501.1
                                L=230 MM

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* 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  76.62.60.537.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                  4  81.38.66.472.1
THERMOWELL TAPERED                   1  76.83.37.502.1
                                L=255 MM

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* VENT POINT                DN 15 FIG.11    DN 15 - 25
Branch:N (:N=br.tab,:S=BNI,F,: =N/A) 1(P1PING 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

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* VENT POINT                DN 20 FIG.11    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

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* VENT POINT                DN 20  FIG.1H  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,:N/A) 1(PIPING COMP.)
BLIND FLANGE                1   76.62.10.412.1
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 151470

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -400	239.2	239.2	236.3	230.4	225.4	223.1

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
 - FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B B B B A
350	C	C	C	C	E	E	E	B	B	B B A
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	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	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 LOW TEMP.	PLANT :	
CLASS NO. : 151470	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 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
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE															
PIPE	74.30.17	023.1	030.1	038.1	054.1	063.1	071.1	079.1	088.1	101.1	113.1	125.1	138.1	147.1	

* FLANGES															
BLIND FLANGE	76.62.12	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	
SPECTACLE BLIND FLANGE	76.88.34	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	
SPACER RING TYPE (ASME FLANGE)	76.88.17	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	
WELDING NECK FLANGE	76.62.86	662.1	664.1	666.1	668.1	670.1	672.1	674.1	676.1	678.1	680.1	682.1	684.1	686.1	

* FITTINGS															
CAP BUTT-WELD.END	76.31.18	172.1	178.1	182.1	192.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.38	172.1	178.1	182.1	192.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.39	172.1	178.1	182.1	192.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
EQUAL TEE BUTT-WELD ENDS	76.31.84	172.1	178.1	182.1	192.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	

* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.00.85					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RB TRUNNION NON EXT	77.00.85					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
BALL VALVE FULL BORE TRUN FLGD	77.00.82					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.82					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
CHECK VALVE FLANGED	77.10.33	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED	77.20.33	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.33	203.1	204.1	205.1	207.1	208.1	210.1	212.1							
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1									

* 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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.97					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		31.70.141.1	31.71.141.1	31.85.039.1	400* 50	79.07.194.1			
25* 15		31.70.151.1	31.71.151.1	31.85.049.1	400* 80	79.07.218.1			
25* 20		31.70.161.1	31.71.161.1	31.85.059.1	400*100	79.07.240.1			
40* 15		31.70.171.1	31.71.171.1	31.85.069.1	400*150	79.07.260.1	29.44.744.1	29.59.744.1	31.85.466.1
40* 20		31.70.181.1	31.71.181.1	31.85.079.1	400*200	79.07.278.1	31.70.459.1	31.71.459.1	31.85.484.1
40* 25		31.70.191.1	31.71.191.1	31.85.089.1	400*250	79.07.294.1	31.70.468.1	31.71.468.1	31.85.510.1
50* 20		31.70.195.1	31.71.195.1	31.85.098.1	400*300	79.07.308.1	31.70.480.1	31.71.480.1	31.85.536.1
50* 25		31.70.201.1	31.71.201.1	31.85.107.1	400*350	79.07.320.1	31.70.491.1	31.71.491.1	31.85.561.1
50* 40		31.70.211.1	31.71.211.1	31.85.116.1					
80* 40		31.70.231.1	31.71.231.1	31.85.125.1					
80* 50	79.07.180.1	31.70.241.1	31.71.241.1	31.85.134.1					
100* 40		31.70.259.1	31.71.259.1	31.85.143.1					
100* 50	79.07.182.1	31.70.271.1	31.71.271.1	31.85.155.1					
100* 80	79.07.206.1	31.70.281.1	31.71.281.1	31.85.167.1					
150* 50	79.07.184.1								
150* 80	79.07.208.1	31.70.301.1	31.71.301.1	31.85.179.1					
150*100	79.07.230.1	31.70.311.1	31.71.311.1	31.85.192.1					
200* 50	79.07.186.1								
200* 80	79.07.210.1								
200*100	79.07.232.1	31.70.331.1	31.71.331.1	31.85.208.1					
200*150	79.07.252.1	31.70.341.1	31.71.341.1	31.85.228.1					
250* 50	79.07.188.1								
250* 80	79.07.212.1								
250*100	79.07.234.1	31.70.349.1	31.71.349.1	31.85.256.1					
250*150	79.07.254.1	31.70.360.1	31.71.360.1	31.85.274.1					
250*200	79.07.272.1	31.70.370.1	31.71.370.1	31.85.296.1					
300* 50	79.07.190.1								
300* 80	79.07.214.1								
300*100	79.07.236.1								
300*150	79.07.256.1	31.70.389.1	31.71.389.1	31.85.313.1					
300*200	79.07.274.1	31.70.400.1	31.71.400.1	31.85.333.1					
300*250	79.07.290.1	31.70.410.1	31.71.410.1	31.85.355.1					
350* 50	79.07.192.1								
350* 80	79.07.216.1								
350*100	79.07.238.1								
350*150	79.07.258.1	31.70.419.1	31.71.419.1	31.85.376.1					
350*200	79.07.276.1	31.70.428.1	31.71.428.1	31.85.395.1					
350*250	79.07.292.1	31.70.441.1	31.71.441.1	31.85.420.1					
350*300	79.07.306.1	31.70.451.1	31.71.451.1	31.85.446.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	821.1	116.1
20	40-400	823.1	118.1
25	40-100	825.1	120.1
	150-400	826.1	124.1
40	50-100	830.1	126.1
	150-400	831.1	128.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.322.1			230 76.83.37.501.1
813	76.80.60.324.1			255 76.83.37.502.1
1219	76.80.60.326.1			305 76.83.37.503.1
1524	76.80.60.328.1			355 76.83.37.505.1
1829	76.80.60.330.1			405 76.83.37.506.1
2134	76.80.60.332.1			455 76.83.37.507.1
2438	76.80.60.334.1			
2743	76.80.60.336.1			
3048	76.80.60.338.1			

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

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	*	120	63.332.1	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	1 1/8	*	180	63.533.1						
100	8	1 1/4	*	200	63.588.1						
150	12	1 3/8	*	260	63.649.1						
200	12	1 5/8	*	350	63.734.1						
250	12	1 7/8	*	400	63.798.1						
300	16	2	*	440	63.829.1						
350	16	2 1/4	*	480	63.861.1						
400	16	2 1/2	*	530	92.704.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

					81.38						81.38
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
							15	4	3/4	*	120
							20	4	3/4	*	130
							25	4	7/8	*	140
							40	4	1	*	160
50	8	7/8	*	160	63.407.1		50	8	7/8	*	170
80	8	1 1/8	*	190	63.535.1		80	8	1 1/8	*	210
100	8	1 1/4	*	210	63.595.1		100	8	1 1/4	*	230
150	12	3/8	*	280	63.653.1		150	12	3/8	*	300
200	12	5/8	*	360	63.736.1		200	12	5/8	*	400
250	12	7/8	*	420	63.804.1		250	12	7/8	*	460
300	16	2	*	460	63.834.1		300	16	2	*	510
350	16	2 1/4	*	500	92.631.1		350	16	2 1/4	*	560
400	16	2 1/2	*	550	92.706.1		400	16	2 1/2	*	620

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	63.417.1
80	8	1 1/8	*	270	63.525.1
100	8	1 1/4	*	300	63.610.1
150	12	3/8	*	430	63.671.1
200	12	5/8	*	560	63.751.1
250	12	7/8	*	640	63.809.1
300	16		*	740	63.840.1
350	16	1/4	*	830	63.862.1
400	16	1/2	*	890	63.890.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.86.662.1

```

```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.464.1
WELDING NECK FLANGE   1  76.62.86.664.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.86.662.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE        1    76.62.86.662.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.662.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

```

* 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 TAPERED                    L=230 MM      1      76.83.37.501.1

```

```

* 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   76.62.52.537.1
GASKET, SPIRAL WOUND              1   85.41.46.512.1
STUD BOLT WITH NUTS               4   81.38.63.472.1
THERMOWELL TAPERED                1   76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE       1  76.62.86.662.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE         1  76.62.86.664.1

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* VENT POINT	DN 20	FIG.DE	DN 50 -400
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	

CLASS 151480

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 75 100 120

PRESSURE BAR GA

DN15 -400 222.3 222.3 222.1 221.2

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESRIPTION) FOR 80+ DEG C.
- FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
- FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
- 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
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	E	B	B	B	A	
250	C	C	C	C	E	E	E	E	B	B	A		
200	C	C	C	C	E	E	E	B	B	A			
150	C	C	C	C	E	E	B	B	A				
100	C	C	C	C	B	B	B	A					
80	C	C	C	B	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	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 LOW TEMP. SOUR	PLANT :	
CLASS NO. : 151480	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352, A350 TRIM: BODY MAT+ENP,AISI 316(L) NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE															
PIPE	74.30.16	023.1	030.1	038.1	054.1	063.1	071.1	079.1	088.1	101.1	113.1	125.1	138.1	147.1	
* FLANGES															
BLIND FLANGE	76.62.12	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	
SPECTACLE BLIND FLANGE	76.88.35	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	
SPACER RING TYPE (ASME FLANGE)	76.88.47	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	
WELDING NECK FLANGE	76.62.86	662.1	664.1	666.1	668.1	670.1	672.1	674.1	676.1	678.1	680.1	682.1	684.1	686.1	
* FITTINGS															
CAP BUTT-WELD.END	76.31.17	172.1	178.1	182.1	192.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	172.1	178.1	182.1	192.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	172.1	178.1	182.1	192.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
EQUAL TEE BUTT-WELD ENDS	76.31.80	172.1	178.1	182.1	192.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.00.85					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RB TRUNNION NON EXT	77.00.85					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
BALL VALVE FULL BORE TRUN FLGD	77.00.82					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.82					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
CHECK VALVE FLANGED	77.10.33	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED	77.20.33	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.33	203.1	204.1	205.1	207.1	208.1	210.1	212.1							
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1									
* 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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.97					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		31.66.141.1	31.75.141.1	31.88.039.1	400* 50	79.07.194.1			
25* 15		31.66.151.1	31.75.151.1	31.88.049.1	400* 80	79.07.218.1			
25* 20		31.66.161.1	31.75.161.1	31.88.059.1	400*100	79.07.240.1			
40* 15		31.66.171.1	31.75.171.1	31.88.069.1	400*150	79.07.260.1	29.45.744.1	29.60.744.1	31.88.466.1
40* 20		31.66.181.1	31.75.181.1	31.88.079.1	400*200	79.07.278.1	31.66.459.1	31.75.459.1	31.88.484.1
40* 25		31.66.191.1	31.75.191.1	31.88.089.1	400*250	79.07.294.1	31.66.468.1	31.75.468.1	31.88.510.1
50* 20		31.66.195.1	31.75.195.1	31.88.098.1	400*300	79.07.308.1	31.66.480.1	31.75.480.1	31.88.536.1
50* 25		31.66.201.1	31.75.201.1	31.88.107.1	400*350	79.07.320.1	31.66.491.1	31.75.491.1	31.88.561.1
50* 40		31.66.211.1	31.75.211.1	31.88.116.1					
80* 40		31.66.231.1	31.75.231.1	31.88.125.1					
80* 50	79.07.180.1	31.66.241.1	31.75.241.1	31.88.134.1					
100* 40		31.66.259.1	31.75.259.1	31.88.143.1					
100* 50	79.07.182.1	31.66.271.1	31.75.271.1	31.88.155.1					
100* 80	79.07.206.1	31.66.281.1	31.75.281.1	31.88.167.1					
150* 50	79.07.184.1								
150* 80	79.07.208.1	31.66.301.1	31.75.301.1	31.88.179.1					
150*100	79.07.230.1	31.66.311.1	31.75.311.1	31.88.192.1					
200* 50	79.07.186.1								
200* 80	79.07.210.1								
200*100	79.07.232.1	31.66.331.1	31.75.331.1	31.88.208.1					
200*150	79.07.252.1	31.66.341.1	31.75.341.1	31.88.228.1					
250* 50	79.07.188.1								
250* 80	79.07.212.1								
250*100	79.07.234.1	31.66.349.1	31.75.349.1	31.88.256.1					
250*150	79.07.254.1	31.66.360.1	31.75.360.1	31.88.274.1					
250*200	79.07.272.1	31.66.370.1	31.75.370.1	31.88.296.1					
300* 50	79.07.190.1								
300* 80	79.07.214.1								
300*100	79.07.236.1								
300*150	79.07.256.1	31.66.389.1	31.75.389.1	31.88.313.1					
300*200	79.07.274.1	31.66.400.1	31.75.400.1	31.88.333.1					
300*250	79.07.290.1	31.66.410.1	31.75.410.1	31.88.355.1					
350* 50	79.07.192.1								
350* 80	79.07.216.1								
350*100	79.07.238.1								
350*150	79.07.258.1	31.66.419.1	31.75.419.1	31.88.376.1					
350*200	79.07.276.1	31.66.428.1	31.75.428.1	31.88.395.1					
350*250	79.07.292.1	31.66.441.1	31.75.441.1	31.88.420.1					
350*300	79.07.306.1	31.66.451.1	31.75.451.1	31.88.446.1					

		BNIF	BNIP
		76.80.37	76.80.31
BRANCH	RUN-PIPE		
15	40-400	821.1	116.1
20	40-400	823.1	118.1
25	40-100	825.1	120.1
	150-400	826.1	124.1
40	50-100	830.1	126.1
	150-400	831.1	128.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.60.662.1			230 76.83.37.501.1
813	76.80.60.664.1			255 76.83.37.502.1
1219	76.80.60.666.1			305 76.83.37.503.1
1524	76.80.60.668.1			355 76.83.37.505.1
1829	76.80.60.670.1			405 76.83.37.506.1
2134	76.80.60.672.1			455 76.83.37.507.1
2438	76.80.60.674.1			
2743	76.80.60.676.1			
3048	76.80.60.678.1			

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

BOLTSET FLANGED JOINTS

81.38					81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM
15	4	3/4	*	110	67.330.1	15	4	3/4	*	110
20	4	3/4	*	120	67.332.1	20	4	3/4	*	120
25	4	7/8	*	130	67.403.1	25	4	7/8	*	130
40	4	1	*	140	67.469.1	40	4	1	*	140
50	8	7/8	*	150	67.406.1					
80	8	1 1/8	*	180	67.533.1					
100	8	1 1/4	*	200	67.588.1					
150	12	1 3/8	*	260	67.649.1					
200	12	1 5/8	*	350	67.734.1					
250	12	1 7/8	*	400	67.798.1					
300	16	2	*	440	67.829.1					
350	16	2 1/4	*	480	67.861.1					
400	16	2 1/2	*	530	94.704.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38						81.38						
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		
							15	4	3/4	*	120	67.332.1
							20	4	3/4	*	130	67.334.1
							25	4	7/8	*	140	67.404.1
							40	4	1	*	160	67.472.1
50	8	7/8	*	160	67.407.1		50	8	7/8	*	170	67.409.1
80	8	1 1/8	*	190	67.535.1		80	8	1 1/8	*	210	67.538.1
100	8	1 1/4	*	210	67.595.1	100	8	1 1/4	*	230	67.598.1	
150	12	1 3/8	*	280	67.653.1	150	12	1 3/8	*	300	67.655.1	
200	12	1 5/8	*	360	67.736.1	200	12	1 5/8	*	400	67.741.1	
250	12	1 7/8	*	420	67.802.1	250	12	1 7/8	*	460	67.806.1	
300	16		*	460	67.833.1	300	16	2	*	510	94.562.1	
350	16	2 1/4	*	500	94.631.1	350	16	2 1/4	*	560	94.637.1	
400	16	2 1/2	*	550	94.706.1	400	16	2 1/2	*	620	94.713.1	

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	
50	8	7/8	*	220	67.417.1
80	8	1 1/8	*	270	67.546.1
100	8	1 1/4	*	300	67.610.1
150	12	1 3/8	*	430	67.670.1
200	12	1 5/8	*	560	67.759.1
250	12	1 7/8	*	640	67.811.1
300	16	2	*	740	67.838.1
350	16	2 1/4	*	830	67.863.1
400	16	2 1/2	*	890	67.888.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.86.662.1

```

```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.464.1
WELDING NECK FLANGE   1  76.62.86.664.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.86.662.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.662.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1      76.62.86.662.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

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* 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      81.38.67.472.1
THERMOWELL TAPERED                   1      76.83.37.501.1
                                L=230 MM

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* 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      76.62.52.537.1
GASKET, SPIRAL WOUND                 1      85.41.46.512.1
STUD BOLT WITH NUTS                  4      81.38.67.472.1
THERMOWELL TAPERED                   1      76.83.37.502.1
                                L=255 MM

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* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE      1  77.30.91.043.1
WELDING NECK FLANGE             1  76.62.86.662.1

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.86.664.1

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* VENT POINT                DN 20  FIG.DE  DN 50 -400
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
MONOFL SINGLE BLOCK NEEDLE 1    77.30.91.044.1

```

CLASS 151490

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-50	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -400	239.2	239.2	236.3	230.4	225.4	223.1

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3
 - 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
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
 - FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	E	B	B	B	B	A
300	C	C	C	C	E	E	E	B	B	B	B	A	
250	C	C	C	C	E	E	E	B	B	B	A		
200	C	C	C	C	E	E	E	B	B	B	A		
150	C	C	C	C	E	E	B	B	A				
100	C	C	C	C	B	B	B	A					
80	C	C	C	B	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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	24.0
250	30.0
300	34.0
350	38.0
400	42.0

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.

CARBON STEEL LOW TEMP.	PLANT :	
CLASS NO. : 151490	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 50-400	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

BNIB	BRANCH FITTING B.W.END OUTLET	DN 15- 50	ASTM A350-LF2
BNIF	BRANCH FITTING FLANGED OUTLET	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 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
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE																
PIPE		74.30.14														
		74.30.17	025.1	032.1	040.1	056.1	065.1	073.1	080.1	089.1	140.1	180.1	230.1	290.1	350.1	
* FLANGES																
BLIND FLANGE		76.62.12	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	
SPECTACLE BLIND FLANGE		76.88.34	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	
SPACER RING TYPE (ASME FLANGE)		76.88.17	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	
WELDING NECK FLANGE		76.62.86	702.1	704.1	706.1	708.1	710.1	712.1	714.1	716.1						
		76.62.87									140.1	180.1	230.1	290.1	350.1	
* FITTINGS																
CAP BUTT-WELD.END		76.31.15									140.1	180.1	230.1	290.1	350.1	
		76.31.18	173.1	179.1	183.1	193.1	213.1	233.1	253.1	273.1						
ELBOW 45 DEG BUTT-WELD ENDS		76.31.38					213.1	233.1	253.1	273.1						
		76.31.44									140.1	180.1	230.1	290.1	350.1	
ELBOW 90 DEG BUTT-WELD ENDS		76.31.39	173.1	179.1	183.1	193.1	213.1	233.1	253.1	273.1						
		76.31.46									140.1	180.1	230.1	290.1	350.1	
EQUAL TEE BUTT-WELD ENDS		76.31.84	173.1	179.1	183.1	193.1	213.1	233.1	253.1	273.1						
		76.31.90									140.1	180.1	230.1	290.1	350.1	
* VALVES																
BALL VALVE FB TRUNNION NON EXT		77.00.86					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RB TRUNNION NON EXT		77.00.86					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
BALL VALVE FULL BORE TRUN FLGD		77.00.83					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RED. BORE TRUN FLGD		77.00.83					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
CHECK VALVE FLANGED		77.10.33	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	
DUAL PL. CHECK VALVE WAFER LUG		77.67.52					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED		77.20.33	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED		77.30.33	203.1	204.1	205.1	207.1	208.1	210.1	212.1							
MONOFL SINGLE BLOCK BALL		77.00.95	463.1	464.1	465.1	467.1	468.1									
* 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		76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET		76.62.97					140.1	144.1	146.1	148.1						

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		31.70.142.1	31.71.142.1	31.85.040.1	400* 50	79.09.240.1			
25* 15		31.70.152.1	31.71.152.1	31.85.050.1	400* 80	79.09.500.1			
25* 20		31.70.162.1	31.71.162.1	31.85.060.1	400*100	79.09.750.1			
40* 15		31.70.172.1	31.71.172.1	31.85.070.1	400*150	79.09.770.1	31.62.762.1	31.63.762.1	31.93.751.1
40* 20		31.70.182.1	31.71.182.1	31.85.080.1	400*200		31.62.806.1	31.63.806.1	31.93.802.1
40* 25		31.70.192.1	31.71.192.1	31.85.090.1	400*250		31.62.856.1	31.63.856.1	31.93.851.1
50* 20		31.70.196.1	31.71.196.1	31.85.099.1	400*300		31.62.901.1	31.63.901.1	31.93.901.1
50* 25		31.70.202.1	31.71.202.1	31.85.108.1	400*350		31.62.951.1	31.63.951.1	31.93.951.1
50* 40		31.70.212.1	31.71.212.1	31.85.117.1					
80* 40		31.70.232.1	31.71.232.1	31.85.126.1					
80* 50	79.07.680.1	31.70.242.1	31.71.242.1	31.85.135.1					
100* 40		31.70.260.1	31.71.260.1	31.85.144.1					
100* 50	79.07.682.1	31.70.272.1	31.71.272.1	31.85.156.1					
100* 80	79.07.694.1	31.70.282.1	31.71.282.1	31.85.168.1					
150* 50	79.07.684.1								
150* 80	79.07.696.1	31.70.302.1	31.71.302.1	31.85.180.1					
150*100	79.07.704.1	31.70.312.1	31.71.312.1	31.85.193.1					
200* 50	79.09.060.1								
200* 80	79.09.300.1								
200*100		31.62.160.1	31.63.160.1	31.93.160.1					
200*150		31.62.195.1	31.63.195.1	31.93.195.1					
250* 50	79.09.090.1								
250* 80	79.09.350.1								
250*100	79.09.648.1	31.62.248.1	31.63.248.1	31.93.230.1					
250*150		31.62.276.1	31.63.276.1	31.93.276.1					
250*200		31.62.326.1	31.63.326.1	31.93.326.1					
300* 50	79.09.140.1								
300* 80	79.09.400.1								
300*100	79.09.650.1								
300*150		31.62.375.1	31.63.375.1	31.93.375.1					
300*200		31.62.437.1	31.63.437.1	31.93.437.1					
300*250		31.62.500.1	31.63.500.1	31.93.500.1					
350* 50	79.09.200.1								
350* 80	79.09.450.1								
350*100	79.09.700.1								
350*150		31.62.561.1	31.63.561.1	31.93.563.1					
350*200		31.62.615.1	31.63.615.1	31.93.615.1					
350*250		31.62.662.1	31.63.662.1	31.93.662.1					
350*300		31.62.707.1	31.63.707.1	31.93.707.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE	-----	
15	40-400	129.1	841.1
20	40-400	130.1	843.1
25	40-100	131.1	845.1
	150-400	133.1	846.1
40	50-100	134.1	850.1
	150-400	135.1	851.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.322.1		230	76.83.37.501.1
813	76.80.60.324.1		255	76.83.37.502.1
1219	76.80.60.326.1		305	76.83.37.503.1
1524	76.80.60.328.1		355	76.83.37.505.1
1829	76.80.60.330.1		405	76.83.37.506.1
2134	76.80.60.332.1		455	76.83.37.507.1
2438	76.80.60.334.1			
2743	76.80.60.336.1			
3048	76.80.60.338.1			

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

BOLTSET FLANGED JOINTS

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	* 120	63.332.1	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	1 1/8	* 180	63.533.1					
100	8	1 1/4	* 200	63.588.1					
150	12	1 3/8	* 260	63.649.1					
200	12	1 5/8	* 350	63.734.1					
250	12	1 7/8	* 400	63.798.1					
300	16	2	* 440	63.829.1					
350	16	2 1/4	* 480	63.861.1					
400	16	2 1/2	* 530	92.704.1					

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

81.38					81.38				
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM
					15	4	3/4	*	120
					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

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	63.417.1
80	8	1	1/8	*	270 63.525.1
100	8	1	1/4	*	300 63.610.1
150	12	1	3/8	*	430 63.671.1
200	12	1	5/8	*	560 63.751.1
250	12	1	7/8	*	640 63.809.1
300	16	2		*	740 63.840.1
350	16	2	1/4	*	830 63.862.1
400	16	2	1/2	*	890 63.890.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.86.702.1

```

```
* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.464.1
WELDING NECK FLANGE   1  76.62.86.704.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-400
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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.86.702.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.702.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

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* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.702.1

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* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

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* 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 TAPERED                   1      76.83.37.501.1
                                L=230 MM

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* 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   76.62.52.537.1
GASKET, SPIRAL WOUND                 1   85.41.46.512.1
STUD BOLT WITH NUTS                  4   81.38.63.472.1
THERMOWELL TAPERED                   1   76.83.37.502.1
                                L=255 MM

```

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* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE      1  77.30.91.043.1
WELDING NECK FLANGE             1  76.62.86.702.1

```

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* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.86.704.1

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* VENT POINT          DN 20  FIG.DE  DN 50 -400
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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1

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CLASS 151500

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 75 100 120

PRESSURE BAR GA

DN15 -400 222.3 222.3 222.1 221.2

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.
 - 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
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B B B B A
350	C	C	C	C	E	E	E	B	B	B B A
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	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	XXS
20	XXS
25	XXS
40	XXS
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 LOW TEMP. SOUR	PLANT :	
CLASS NO. : 151500	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 151500, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNIB	BRANCH FITTING B.W.END OUTLET	DN 15- 50	ASTM A350-LF2
BNIF	BRANCH FITTING FLANGED OUTLET	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352+ENP,A350+ENP TRIM: BODY MAT,AISI 316,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: AISI 316(L),STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 151500, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE															
PIPE	74.30.16	025.1	032.1	040.1	056.1	063.1	071.1	079.1	088.1	101.1	113.1	125.1	138.1	147.1	
* FLANGES															
BLIND FLANGE	76.62.12	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	
SPECTACLE BLIND FLANGE	76.88.35	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	
SPACER RING TYPE (ASME FLANGE)	76.88.47	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	
WELDING NECK FLANGE	76.62.86	702.1	704.1	706.1	708.1	670.1	672.1	674.1	676.1	678.1	680.1	682.1	684.1	686.1	
* FITTINGS															
CAP BUTT-WELD.END	76.31.17	173.1	179.1	183.1	193.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	173.1	179.1	183.1	193.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	173.1	179.1	183.1	193.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
EQUAL TEE BUTT-WELD ENDS	76.31.80	173.1	179.1	183.1	193.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.00.86					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RB TRUNNION NON EXT	77.00.86					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
BALL VALVE FULL BORE TRUN FLGD	77.00.83					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.83					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
CHECK VALVE FLANGED	77.10.33	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.52					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED	77.20.33	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.33	203.1	204.1	205.1	207.1	208.1	210.1	212.1							
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1									
* 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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.97					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		31.66.142.1	31.75.142.1	31.88.040.1	400* 50	79.07.194.1			
25* 15		31.66.152.1	31.75.152.1	31.88.050.1	400* 80	79.07.218.1			
25* 20		31.66.162.1	31.75.162.1	31.88.060.1	400*100	79.07.240.1			
40* 15		31.66.172.1	31.75.172.1	31.88.070.1	400*150	79.07.260.1	29.45.744.1	29.60.744.1	31.88.466.1
40* 20		31.66.182.1	31.75.182.1	31.88.080.1	400*200	79.07.278.1	31.66.459.1	31.75.459.1	31.88.484.1
40* 25		31.66.192.1	31.75.192.1	31.88.090.1	400*250	79.07.294.1	31.66.468.1	31.75.468.1	31.88.510.1
50* 20		29.45.195.1	29.60.195.1	31.88.103.1	400*300	79.07.308.1	31.66.480.1	31.75.480.1	31.88.536.1
50* 25		31.66.203.1	31.75.203.1	31.88.112.1	400*350	79.07.320.1	31.66.491.1	31.75.491.1	31.88.561.1
50* 40		31.66.213.1	31.75.213.1	31.88.121.1					
80* 40		31.66.233.1	31.75.233.1	31.88.130.1					
80* 50	79.07.180.1	31.66.241.1	31.75.241.1	31.88.134.1					
100* 40		31.66.257.1	31.75.257.1	31.88.151.1					
100* 50	79.07.182.1	31.66.271.1	31.75.271.1	31.88.155.1					
100* 80	79.07.206.1	31.66.281.1	31.75.281.1	31.88.167.1					
150* 50	79.07.184.1								
150* 80	79.07.208.1	31.66.301.1	31.75.301.1	31.88.179.1					
150*100	79.07.230.1	31.66.311.1	31.75.311.1	31.88.192.1					
200* 50	79.07.186.1								
200* 80	79.07.210.1								
200*100	79.07.232.1	31.66.331.1	31.75.331.1	31.88.208.1					
200*150	79.07.252.1	31.66.341.1	31.75.341.1	31.88.228.1					
250* 50	79.07.188.1								
250* 80	79.07.212.1								
250*100	79.07.234.1	31.66.349.1	31.75.349.1	31.88.256.1					
250*150	79.07.254.1	31.66.360.1	31.75.360.1	31.88.274.1					
250*200	79.07.272.1	31.66.370.1	31.75.370.1	31.88.296.1					
300* 50	79.07.190.1								
300* 80	79.07.214.1								
300*100	79.07.236.1								
300*150	79.07.256.1	31.66.389.1	31.75.389.1	31.88.313.1					
300*200	79.07.274.1	31.66.400.1	31.75.400.1	31.88.333.1					
300*250	79.07.290.1	31.66.410.1	31.75.410.1	31.88.355.1					
350* 50	79.07.192.1								
350* 80	79.07.216.1								
350*100	79.07.238.1								
350*150	79.07.258.1	31.66.419.1	31.75.419.1	31.88.376.1					
350*200	79.07.276.1	31.66.428.1	31.75.428.1	31.88.395.1					
350*250	79.07.292.1	31.66.441.1	31.75.441.1	31.88.420.1					
350*300	79.07.306.1	31.66.451.1	31.75.451.1	31.88.446.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-400	129.1	841.1
20	40-400	130.1	843.1
25	40-100	131.1	845.1
	150-400	133.1	846.1
40	50-100	134.1	850.1
	150-400	135.1	851.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.662.1		230	76.83.37.501.1
813	76.80.60.664.1		255	76.83.37.502.1
1219	76.80.60.666.1		305	76.83.37.503.1
1524	76.80.60.668.1		355	76.83.37.505.1
1829	76.80.60.670.1		405	76.83.37.506.1
2134	76.80.60.672.1		455	76.83.37.507.1
2438	76.80.60.674.1			
2743	76.80.60.676.1			
3048	76.80.60.678.1			

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

BOLTSET FLANGED JOINTS

BOLTSET METER-RUN

					81.38						81.38
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
15	4	3/4	*	110	67.330.1	15	4	3/4	*	110	67.330.1
20	4	3/4	*	120	67.332.1	20	4	3/4	*	120	67.332.1
25	4	7/8	*	130	67.403.1	25	4	7/8	*	130	67.403.1
40	4	1	*	140	67.469.1	40	4	1	*	140	67.469.1
50	8	7/8	*	150	67.406.1						
80	8	1 1/8	*	180	67.533.1						
100	8	1 1/4	*	200	67.588.1						
150	12	1 3/8	*	260	67.649.1						
200	12	1 5/8	*	350	67.734.1						
250	12	1 7/8	*	400	67.798.1						
300	16	2	*	440	67.829.1						
350	16	2 1/4	*	480	67.861.1						
400	16	2 1/2	*	530	94.704.1						

BOLTSET ORIFICE FLANGES

BOLTSET SPECTACLE/SPACER

					81.38						81.38
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM	
							15	4	3/4	*	120
							20	4	3/4	*	130
							25	4	7/8	*	140
							40	4	1	*	160
50	8	7/8	*	160	67.407.1		50	8	7/8	*	170
80	8	1 1/8	*	190	67.535.1		80	8	1 1/8	*	210
100	8	1 1/4	*	210	67.595.1		100	8	1 1/4	*	230
150	12	3/8	*	280	67.653.1		150	12	3/8	*	300
200	12	5/8	*	360	67.736.1		200	12	5/8	*	400
250	12	7/8	*	420	67.802.1		250	12	7/8	*	460
300	16		*	460	67.833.1		300	16	2	*	510
350	16	2 1/4	*	500	94.631.1		350	16	2 1/4	*	560
400	16	2 1/2	*	550	94.706.1		400	16	2 1/2	*	620

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	67.417.1
80	8	1 1/8	*	270	67.546.1
100	8	1 1/4	*	300	67.610.1
150	12	3/8	*	430	67.670.1
200	12	5/8	*	560	67.759.1
250	12	7/8	*	640	67.811.1
300	16	2	*	740	67.838.1
350	16	2 1/4	*	830	67.863.1
400	16	2 1/2	*	890	67.888.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.463.1
WELDING NECK FLANGE    1  76.62.86.702.1

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* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.464.1
WELDING NECK FLANGE   1  76.62.86.704.1

```

```

* DRAIN POINT          DN 20 FIG.DE   DN 50 -400
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
MONOFL SINGLE BLOCK BALL 1   77.00.95.464.1

```

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.86.702.1
```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1      77.85.47.063.1
WELDING NECK FLANGE               1      76.62.86.702.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
WELDING NECK FLANGE       1    76.62.86.702.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

```

* 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      81.38.67.472.1
THERMOWELL TAPERED                    L=230 MM      1      76.83.37.501.1

```

```

* 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      76.62.52.537.1
GASKET, SPIRAL WOUND                 1      85.41.46.512.1
STUD BOLT WITH NUTS                  4      81.38.67.472.1
THERMOWELL TAPERED                   1      76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                      DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE      1  77.30.91.043.1
WELDING NECK FLANGE             1  76.62.86.702.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1
WELDING NECK FLANGE        1  76.62.86.704.1

```

```

* VENT POINT                DN 20 FIG.DE    DN 50 -400
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
MONOFL SINGLE BLOCK NEEDLE 1    77.30.91.044.1

```


CLASS 151501

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 75 100 120

PRESSURE BAR GA

DN15 -400 222.3 222.3 222.1 221.2

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.3, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.
- 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
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE											
	15	20	25	40	50	80	100	150	200	250	300	350
400	C	C	C	C	E	E	E	E	B	B	B	B
350	C	C	C	C	E	E	E	B	B	B	B	A
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	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	XXS
20	XXS
25	XXS
40	XXS
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 LOW TEMP. SOUR	PLANT :	
CLASS NO. : 151501	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 151501, REV.O PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-400	ASTM A333-6
PNPP	PIPE NIPPLE 50MM	---	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A350-LF2
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BNIB	BRANCH FITTING B.W.END OUTLET	DN 15- 50	ASTM A350-LF2
BNIF	BRANCH FITTING FLANGED OUTLET	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

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A352-LCB/C,A350-LF2 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* 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 A333-6
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-400	ASTM A350-LF2
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 151501, REV.O PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE															
PIPE	74.30.16	025.1	032.1	040.1	056.1	063.1	071.1	079.1	088.1	101.1	113.1	125.1	138.1	147.1	

* FLANGES															
BLIND FLANGE	76.62.12	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	
SPECTACLE BLIND FLANGE	76.88.35	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	
SPACER RING TYPE (ASME FLANGE)	76.88.47	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	
WELDING NECK FLANGE	76.62.86	702.1	704.1	706.1	708.1	670.1	672.1	674.1	676.1	678.1	680.1	682.1	684.1	686.1	

* FITTINGS															
CAP BUTT-WELD.END	76.31.17	173.1	179.1	183.1	193.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.31.34	173.1	179.1	183.1	193.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.31.43	173.1	179.1	183.1	193.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	
EQUAL TEE BUTT-WELD ENDS	76.31.80	173.1	179.1	183.1	193.1	212.1	232.1	252.1	272.1	292.1	315.1	337.1	357.1	377.1	

* VALVES															
BALL VALVE FB TRUNNION NON EXT	77.00.94					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RB TRUNNION NON EXT	77.00.94					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
BALL VALVE FULL BORE TRUN FLGD	77.00.93					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.93					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
CHECK VALVE FLANGED	77.10.44	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	
DUAL PL. CHECK VALVE WAFER LUG	77.67.58					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
GATE VALVE FLANGED	77.20.54	203.1	204.1	205.1	207.1										
GLOBE VALVE FLANGED	77.30.54	203.1	204.1	205.1	207.1	208.1	210.1	212.1							
MONOFL SINGLE BLOCK BALL	77.00.97	463.1	464.1	465.1	467.1	468.1									

* 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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.97					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		31.66.142.1	31.75.142.1	31.88.040.1	400* 50	79.07.194.1			
25* 15		31.66.152.1	31.75.152.1	31.88.050.1	400* 80	79.07.218.1			
25* 20		31.66.162.1	31.75.162.1	31.88.060.1	400*100	79.07.240.1			
40* 15		31.66.172.1	31.75.172.1	31.88.070.1	400*150	79.07.260.1	29.45.744.1	29.60.744.1	31.88.466.1
40* 20		31.66.182.1	31.75.182.1	31.88.080.1	400*200	79.07.278.1	31.66.459.1	31.75.459.1	31.88.484.1
40* 25		31.66.192.1	31.75.192.1	31.88.090.1	400*250	79.07.294.1	31.66.468.1	31.75.468.1	31.88.510.1
50* 20		29.45.195.1	29.60.195.1	31.88.103.1	400*300	79.07.308.1	31.66.480.1	31.75.480.1	31.88.536.1
50* 25		31.66.203.1	31.75.203.1	31.88.112.1	400*350	79.07.320.1	31.66.491.1	31.75.491.1	31.88.561.1
50* 40		31.66.213.1	31.75.213.1	31.88.121.1					
80* 40		31.66.233.1	31.75.233.1	31.88.130.1					
80* 50	79.07.180.1	31.66.241.1	31.75.241.1	31.88.134.1					
100* 40		31.66.257.1	31.75.257.1	31.88.151.1					
100* 50	79.07.182.1	31.66.271.1	31.75.271.1	31.88.155.1					
100* 80	79.07.206.1	31.66.281.1	31.75.281.1	31.88.167.1					
150* 50	79.07.184.1								
150* 80	79.07.208.1	31.66.301.1	31.75.301.1	31.88.179.1					
150*100	79.07.230.1	31.66.311.1	31.75.311.1	31.88.192.1					
200* 50	79.07.186.1								
200* 80	79.07.210.1								
200*100	79.07.232.1	31.66.331.1	31.75.331.1	31.88.208.1					
200*150	79.07.252.1	31.66.341.1	31.75.341.1	31.88.228.1					
250* 50	79.07.188.1								
250* 80	79.07.212.1								
250*100	79.07.234.1	31.66.349.1	31.75.349.1	31.88.256.1					
250*150	79.07.254.1	31.66.360.1	31.75.360.1	31.88.274.1					
250*200	79.07.272.1	31.66.370.1	31.75.370.1	31.88.296.1					
300* 50	79.07.190.1								
300* 80	79.07.214.1								
300*100	79.07.236.1								
300*150	79.07.256.1	31.66.389.1	31.75.389.1	31.88.313.1					
300*200	79.07.274.1	31.66.400.1	31.75.400.1	31.88.333.1					
300*250	79.07.290.1	31.66.410.1	31.75.410.1	31.88.355.1					
350* 50	79.07.192.1								
350* 80	79.07.216.1								
350*100	79.07.238.1								
350*150	79.07.258.1	31.66.419.1	31.75.419.1	31.88.376.1					
350*200	79.07.276.1	31.66.428.1	31.75.428.1	31.88.395.1					
350*250	79.07.292.1	31.66.441.1	31.75.441.1	31.88.420.1					
350*300	79.07.306.1	31.66.451.1	31.75.451.1	31.88.446.1					

		BNIB	BNIF
		76.80.31	76.80.37
BRANCH	RUN-PIPE		
15	40-400	129.1	841.1
20	40-400	130.1	843.1
25	40-100	131.1	845.1
	150-400	133.1	846.1
40	50-100	134.1	850.1
	150-400	135.1	851.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.60.662.1		230	76.83.37.501.1
813	76.80.60.664.1		255	76.83.37.502.1
1219	76.80.60.666.1		305	76.83.37.503.1
1524	76.80.60.668.1		355	76.83.37.505.1
1829	76.80.60.670.1		405	76.83.37.506.1
2134	76.80.60.672.1		455	76.83.37.507.1
2438	76.80.60.674.1			
2743	76.80.60.676.1			
3048	76.80.60.678.1			

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

BOLTSET METER-RUN

81.38					81.38					
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM
15	4	3/4	*	110	67.330.1	15	4	3/4	*	110
20	4	3/4	*	120	67.332.1	20	4	3/4	*	120
25	4	7/8	*	130	67.403.1	25	4	7/8	*	130
40	4	1	*	140	67.469.1	40	4	1	*	140
50	8	7/8	*	150	67.406.1					
80	8	1 1/8	*	180	67.533.1					
100	8	1 1/4	*	200	67.588.1					
150	12	1 3/8	*	260	67.649.1					
200	12	1 5/8	*	350	67.734.1					
250	12	1 7/8	*	400	67.798.1					
300	16	2	*	440	67.829.1					
350	16	2 1/4	*	480	67.861.1					
400	16	2 1/2	*	530	94.704.1					

BOLTSET SPECTACLE/SPACER

81.38						81.38						
DN	NR	INCH	*	MM		DN	NR	INCH	*	MM		
							15	4	3/4	*	120	67.332.1
							20	4	3/4	*	130	67.334.1
							25	4	7/8	*	140	67.404.1
							40	4	1	*	160	67.472.1
50	8	7/8	*	160	67.407.1		50	8	7/8	*	170	67.409.1
80	8	1 1/8	*	190	67.535.1		80	8	1 1/8	*	210	67.538.1
100	8	1 1/4	*	210	67.595.1	100	8	1 1/4	*	230	67.598.1	
150	12	1 3/8	*	280	67.653.1	150	12	1 3/8	*	300	67.655.1	
200	12	1 5/8	*	360	67.736.1	200	12	1 5/8	*	400	67.741.1	
250	12	1 7/8	*	420	67.802.1	250	12	1 7/8	*	460	67.806.1	
300	16		*	460	67.833.1	300	16	2	*	510	94.562.1	
350	16	2 1/4	*	500	94.631.1	350	16	2 1/4	*	560	94.637.1	
400	16	2 1/2	*	550	94.706.1	400	16	2 1/2	*	620	94.713.1	

81.38

DN	NR	INCH	* MM	
50	8	7/8	* 220	67.417.1
80	8	1/8	* 270	67.546.1
100	8	1/4	* 300	67.610.1
150	12	3/8	* 430	67.670.1
200	12	5/8	* 560	67.759.1
250	12	7/8	* 640	67.811.1
300	16	2	* 740	67.838.1
350	16	2 1/4	* 830	67.863.1
400	16	2 1/2	* 890	67.888.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.463.1
WELDING NECK FLANGE    1  76.62.86.702.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.464.1
WELDING NECK FLANGE    1  76.62.86.704.1

```

```

* DRAIN POINT          DN 20 FIG.DE   DN 50 -400
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
MONOFL SINGLE BLOCK BALL 1   77.00.97.464.1

```

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* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.363.1
WELDING NECK FLANGE       2  76.62.86.702.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1      77.85.47.363.1
WELDING NECK FLANGE               1      76.62.86.702.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.363.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
WELDING NECK FLANGE        1  76.62.86.702.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1

```

```

* 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      81.38.67.472.1
THERMOWELL TAPERED                    1      76.83.37.501.1
                                L=230 MM

```

```

* 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  76.62.52.537.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                   4  81.38.67.472.1
THERMOWELL TAPERED                   1  76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.92.043.1
WELDING NECK FLANGE       1  76.62.86.702.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.92.004.1
WELDING NECK FLANGE         1  76.62.86.704.1

```

* VENT POINT	DN 20	FIG.DE	DN 50 -400
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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.92.044.1	

CLASS 151520

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

PRESSURE BAR GA
DN15 -400 222.3 222.3

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
- 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
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	B	B	B	B	A
350	C	C	C	C	E	E	E	B	B	B	B	A	
300	C	C	C	C	E	E	E	B	B	B	A		
250	C	C	C	C	E	E	E	B	B	B	A		
200	C	C	C	C	E	E	B	B	B	A			
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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
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. : 151520	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 151520, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A106-B
		DN250-400	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6

* 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 80-200	ASTM A105
		DN250-400	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* MISCELLANEOUS

CLBL	BLIND HUB FOR CLAMP COUPLING	DN 15-300	AISI 4140 WITH PTFE COATING
CLHB	HUB FOR CLAMP COUPLING BW END	DN 15-300	ASTM A350-LF2
CLSR	SEAL RING FOR CLAMP COUPLING	DN 15-300	AISI 4140 WITH PTFE COATING
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	MONEL 400
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 151520, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

		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	161.1	227.1	267.1					
	74.30.16										113.1	125.1	138.1	147.1	
* 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							974.1	976.1	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								
* FITTINGS															
CAP BUTT-WELD.END	76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1					
	76.31.17										315.1	337.1	357.1	377.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1					
	76.31.34										315.1	337.1	357.1	377.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1					
	76.31.43										315.1	337.1	357.1	377.1	
EQUAL TEE BUTT-WELD ENDS	76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1					
	76.31.80										315.1	337.1	357.1	377.1	
* VALVES															
BALL VALVE FULL BORE TRUN FLGD	77.00.73					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.73					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
CHECK VALVE FLANGED	77.10.05	203.1	204.1	205.1	207.1										
	77.10.23					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					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										
GLOBE VALVE FLANGED	77.30.05	203.1	204.1	205.1	207.1										
	77.30.23					208.1	210.1	212.1							
MONOFL SINGLE BLOCK BALL	77.00.95	463.1	464.1	465.1	467.1	468.1									
* MISCELLANEOUS															
BLIND HUB FOR CLAMP COUPLING	76.81.09	028.1	028.1	026.1	034.1	048.1	086.1	108.1	148.1	204.1	252.1	302.1			
CLAMP FOR CLAMP COUPLING	76.81.01			006.1	008.1	010.1	012.1	014.1	018.1						
HUB FOR CLAMP COUPLING BW END	76.81.13	008.1	016.1	026.1	036.1	048.1	088.1	108.1	148.1	204.1	252.1	302.1			
SEAL RING FOR CLAMP COUPLING	76.81.05	006.1	006.1	012.1	030.1	030.1	060.1	084.1	126.1	192.1	246.1	312.1			
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	76.64.96	082.1	084.1	086.1	088.1										
ORIFICE FLANGE SET	76.62.95					140.1	144.1	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		30.66.142.1	30.67.142.1	30.88.040.1	400* 50	79.07.374.1			
25* 15		30.66.152.1	30.67.152.1	30.88.050.1	400* 80	79.07.404.1			
25* 20		30.66.162.1	30.67.162.1	30.88.060.1	400*100	79.07.240.1			
40* 15		30.66.172.1	30.67.172.1	30.88.070.1	400*150	79.07.260.1	29.45.744.1	29.60.744.1	31.88.466.1
40* 20		30.66.182.1	30.67.182.1	30.88.080.1	400*200	79.07.278.1	31.66.459.1	31.75.459.1	31.88.484.1
40* 25		30.66.192.1	30.67.192.1	30.88.090.1	400*250	79.07.294.1	31.66.468.1	31.75.468.1	31.88.510.1
50* 20		30.66.195.1	30.67.195.1	30.88.099.1	400*300	79.07.308.1	31.66.480.1	31.75.480.1	31.88.536.1
50* 25		30.66.202.1	30.67.202.1	30.88.108.1	400*350	79.07.320.1	31.66.491.1	31.75.491.1	31.88.561.1
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		30.66.257.1	30.67.257.1	30.88.151.1					
100* 50		30.66.274.1	30.67.274.1	30.88.163.1					
100* 80		30.66.284.1	30.67.284.1	30.88.175.1					
150* 50	79.03.102.1								
150* 80		30.66.294.1	30.67.294.1	30.88.187.1					
150*100	79.03.230.1	30.66.311.1	30.67.311.1	30.88.192.1					
200* 50	79.03.103.1								
200* 80	79.03.116.1								
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	79.07.368.1								
250* 80	79.07.398.1								
250*100	79.07.234.1	31.66.349.1	31.75.349.1	31.88.256.1					
250*150	79.07.254.1	31.66.360.1	31.75.349.1	31.88.274.1					
250*200	79.07.272.1	31.66.370.1	31.75.370.1	31.88.296.1					
300* 50	79.07.370.1								
300* 80	79.07.400.1								
300*100	79.07.236.1								
300*150	79.07.256.1	31.66.389.1	31.75.389.1	31.88.313.1					
300*200	79.07.274.1	31.66.400.1	31.75.400.1	31.88.333.1					
300*250	79.07.290.1	31.66.410.1	31.75.410.1	31.88.355.1					
350* 50	79.07.372.1								
350* 80	79.07.402.1								
350*100	79.07.238.1								
350*150	79.07.258.1	31.66.419.1	31.75.419.1	31.88.376.1					
350*200	79.07.276.1	31.66.428.1	31.75.428.1	31.88.395.1					
350*250	79.07.292.1	31.66.441.1	31.75.441.1	31.88.420.1					
350*300	79.07.306.1	31.66.451.1	31.75.451.1	31.88.446.1					

		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	76.83.37.501.1
813	76.80.60.484.1		255	76.83.37.502.1
1219	76.80.60.486.1		305	76.83.37.503.1
1524	76.80.60.488.1		355	76.83.37.505.1
1829	76.80.60.490.1		405	76.83.37.506.1
2134	76.80.60.492.1		455	76.83.37.507.1
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

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
					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	3/8	*	280	150	12	3/8	*	300
200	12	5/8	*	360	200	12	5/8	*	400
250	12	7/8	*	420	250	12	7/8	*	460
300	16		*	460	300	16		*	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

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	66.417.1
80	8	1 1/8	* 270	66.550.1
100	8	1 1/4	* 300	66.610.1
150	12	1 3/8	* 430	66.671.1
200	12	1 5/8	* 560	86.357.1
250	12	1 7/8	* 640	86.505.1
300	16	2	* 740	86.585.1
350	16	2 1/4	* 830	86.663.1
400	16	2 1/2	* 890	86.737.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.00.95.463.1
WELDING NECK FLANGE  1  76.62.80.032.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.95.464.1
WELDING NECK FLANGE    1  76.62.80.034.1

```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.00.95.464.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1
WELDING NECK FLANGE       2  76.62.80.032.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.063.1
WELDING NECK FLANGE               1  76.62.80.032.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.063.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.063.1
WELDING NECK FLANGE       1      76.62.80.032.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.063.1

```

```

* 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                   1  76.83.37.501.1
                                L=230 MM

```

```

* 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                   1  76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.043.1
WELDING NECK FLANGE       1  76.62.80.032.1

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```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.91.044.1
WELDING NECK FLANGE         1  76.62.80.034.1

```

* VENT POINT	DN 20	FIG.DE	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	
MONOFL SINGLE BLOCK NEEDLE	1	77.30.91.044.1	

CLASS 151521

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

PRESSURE BAR GA
DN15 -400 222.3 222.3

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - COLD BENDING IS NOT ALLOWED.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - 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
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE											
	15	20	25	40	50	80	100	150	200	250	300	350
400	C	C	C	C	E	E	E	E	B	B	B	B A
350	C	C	C	C	E	E	E	B	B	B	B	A
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	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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
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. : 151521	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 151521, REV.O PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A106-B
		DN250-400	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-400	ASTM A105
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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 15-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6

* 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 80-200	ASTM A105
		DN250-400	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-200	ASTM A234-WPB
		DN250-400	ASTM A420-WPL6

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* MISCELLANEOUS

CLBL	BLIND HUB FOR CLAMP COUPLING	DN 15-300	AISI 4140 WITH PTFE COATING
CLHB	HUB FOR CLAMP COUPLING BW END	DN 15-300	ASTM A350-LF2
CLSR	SEAL RING FOR CLAMP COUPLING	DN 15-300	AISI 4140 WITH PTFE COATING
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	MONEL 400
			LJ END FLANGES: ASTM A350-LF2
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	MONEL 400

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 151521, REV.O PAGE 3
ISSUE DATE : DECEMBER 1998

		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	161.1	227.1	267.1				
		74.30.16										113.1	125.1	138.1	147.1
* 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							974.1	976.1	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							
* FITTINGS															
CAP BUTT-WELD.END		76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1				
		76.31.17										315.1	337.1	357.1	377.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.34	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1				
		76.31.34										315.1	337.1	357.1	377.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.42	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1				
		76.31.43										315.1	337.1	357.1	377.1
EQUAL TEE BUTT-WELD ENDS		76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	652.1	672.1	695.1				
		76.31.80										315.1	337.1	357.1	377.1
* VALVES															
BALL VALVE FULL BORE TRUN FLGD		77.00.91					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1
BALL VALVE RED. BORE TRUN FLGD		77.00.91					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
CHECK VALVE FLANGED		77.10.43	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
DUAL PL. CHECK VALVE WAFER LUG		77.67.57					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
GATE VALVE FLANGED		77.20.53	203.1	204.1	205.1	207.1									
GLOBE VALVE FLANGED		77.30.53	203.1	204.1	205.1	207.1	208.1	210.1	212.1						
MONOFL SINGLE BLOCK BALL		77.00.97	463.1	464.1	465.1	467.1	468.1								
* MISCELLANEOUS															
BLIND HUB FOR CLAMP COUPLING		76.81.09	028.1	028.1	026.1	034.1	048.1	086.1	108.1	148.1	204.1	252.1	302.1		
CLAMP FOR CLAMP COUPLING		76.81.01			006.1	008.1	010.1	012.1	014.1	018.1					
HUB FOR CLAMP COUPLING BW END		76.81.13	008.1	016.1	026.1	036.1	048.1	088.1	108.1	148.1	204.1	252.1	302.1		
SEAL RING FOR CLAMP COUPLING		76.81.05	006.1	006.1	012.1	030.1	030.1	060.1	084.1	126.1	192.1	246.1	312.1		
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		76.64.96	082.1	084.1	086.1	088.1									
ORIFICE FLANGE SET		76.62.95					140.1	144.1	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		30.66.142.1	30.67.142.1	30.88.040.1	400* 50	79.07.374.1			
25* 15		30.66.152.1	30.67.152.1	30.88.050.1	400* 80	79.07.404.1			
25* 20		30.66.162.1	30.67.162.1	30.88.060.1	400*100	79.07.240.1			
40* 15		30.66.172.1	30.67.172.1	30.88.070.1	400*150	79.07.260.1	29.45.744.1	29.60.744.1	31.88.466.1
40* 20		30.66.182.1	30.67.182.1	30.88.080.1	400*200	79.07.278.1	31.66.459.1	31.75.459.1	31.88.484.1
40* 25		30.66.192.1	30.67.192.1	30.88.090.1	400*250	79.07.294.1	31.66.468.1	31.75.468.1	31.88.510.1
50* 20		30.66.195.1	30.67.195.1	30.88.099.1	400*300	79.07.308.1	31.66.480.1	31.75.480.1	31.88.536.1
50* 25		30.66.202.1	30.67.202.1	30.88.108.1	400*350	79.07.320.1	31.66.491.1	31.75.491.1	31.88.561.1
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		30.66.257.1	30.67.257.1	30.88.151.1					
100* 50		30.66.274.1	30.67.274.1	30.88.163.1					
100* 80		30.66.284.1	30.67.284.1	30.88.175.1					
150* 50	79.03.102.1								
150* 80		30.66.294.1	30.67.294.1	30.88.187.1					
150*100	79.03.230.1	30.66.311.1	30.67.311.1	30.88.192.1					
200* 50	79.03.103.1								
200* 80	79.03.116.1								
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	79.07.368.1								
250* 80	79.07.398.1								
250*100	79.07.234.1	31.66.349.1	31.75.349.1	31.88.256.1					
250*150	79.07.254.1	31.66.360.1	31.75.349.1	31.88.274.1					
250*200	79.07.272.1	31.66.370.1	31.75.370.1	31.88.296.1					
300* 50	79.07.370.1								
300* 80	79.07.400.1								
300*100	79.07.236.1								
300*150	79.07.256.1	31.66.389.1	31.75.389.1	31.88.313.1					
300*200	79.07.274.1	31.66.400.1	31.75.400.1	31.88.333.1					
300*250	79.07.290.1	31.66.410.1	31.75.410.1	31.88.355.1					
350* 50	79.07.372.1								
350* 80	79.07.402.1								
350*100	79.07.238.1								
350*150	79.07.258.1	31.66.419.1	31.75.419.1	31.88.376.1					
350*200	79.07.276.1	31.66.428.1	31.75.428.1	31.88.395.1					
350*250	79.07.292.1	31.66.441.1	31.75.441.1	31.88.420.1					
350*300	79.07.306.1	31.66.451.1	31.75.451.1	31.88.446.1					

		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	76.83.37.501.1
813	76.80.60.484.1		255	76.83.37.502.1
1219	76.80.60.486.1		305	76.83.37.503.1
1524	76.80.60.488.1		355	76.83.37.505.1
1829	76.80.60.490.1		405	76.83.37.506.1
2134	76.80.60.492.1		455	76.83.37.507.1
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

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	3/8	*	280	66.652.1		150	12	3/8	*	300	66.655.1
200	12	5/8	*	360	66.736.1		200	12	5/8	*	400	66.741.1
250	12	7/8	*	420	66.802.1		250	12	7/8	*	460	66.806.1
300	16		*	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

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	66.417.1
80	8 1	1/8	* 270	66.550.1
100	8 1	1/4	* 300	66.610.1
150	12 1	3/8	* 430	66.671.1
200	12 1	5/8	* 560	86.357.1
250	12 1	7/8	* 640	86.505.1
300	16 2		* 740	86.585.1
350	16 2	1/4	* 830	86.663.1
400	16 2	1/2	* 890	86.737.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.463.1
WELDING NECK FLANGE    1  76.62.80.032.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.00.97.464.1
WELDING NECK FLANGE    1  76.62.80.034.1

```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.00.97.464.1		

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -400
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.363.1
WELDING NECK FLANGE       2  76.62.80.032.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CB    DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1    77.85.47.363.1
WELDING NECK FLANGE       1    76.62.80.032.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.363.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1
WELDING NECK FLANGE       1      76.62.80.032.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -400
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.363.1

```

```

* 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                    1      76.83.37.501.1
                                L=230 MM

```

```

* 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                1   76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.92.043.1
WELDING NECK FLANGE        1  76.62.80.032.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.30.92.044.1
WELDING NECK FLANGE       1  76.62.80.034.1

```

```

* VENT POINT                DN 20  FIG.DE  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
MONOFL SINGLE BLOCK NEEDLE 1    77.30.92.044.1

```

* VENT POINT	DN 20	FIG.DE	DN 80	-400
Branch:S (:N=br.tab,:S=BNIF,:=N/A)	1	76.62	10.412	1
BLIND FLANGE	1	76.62	10.412	1
GASKET, SPIRAL WOUND	2	85.41	46.506	1
MONOFL SINGLE BLOCK NEEDLE	1	77.30	92.044	1

CLASS 153410

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-20	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -100	248.2	248.2	240.5	224.8	210.9	203.4
DN150-150	236.6	236.6	236.6	224.8	210.9	203.4
DN200-200	228.4	228.4	228.4	224.8	210.9	203.4

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE 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.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	B	B A
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	80S
20	80S
25	80S
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.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 153410	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-100	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316 (L), NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-100	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316 (L), NYLON
CHVF	CHECK VALVE FLANGED	DN 15-100	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-100	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L), STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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 A182-F316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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

* PIPE											
PIPE		74.36.33	020.1	028.1	036.1	054.1	063.1	071.1	079.1	088.1	100.1
* FLANGES											
BLIND FLANGE		76.65.10	500.1	501.1	502.1	503.1	504.1	505.1	506.1	507.1	508.1
SPECTACLE BLIND FLANGE		76.88.10	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	608.1	612.1	616.1	618.1	620.1	622.1	624.1	626.1	628.1
WELDING NECK FLANGE		76.65.80	602.1	604.1	606.1	611.1	610.1	612.1	614.1	616.1	618.1
* FITTINGS											
CAP BUTT-WELD.END		76.33.19	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	788.1	798.1	808.1	830.1	840.1	860.1	880.1	899.1	913.1
* VALVES											
BALL VALVE FULL BORE TRUN FLGD		77.03.74					708.1	710.1	712.1		
BALL VALVE RED. BORE TRUN FLGD		77.03.74					208.1	210.1	212.1		
CHECK VALVE FLANGED		77.13.03	203.1	204.1	205.1	207.1	208.1	210.1	212.1		
DUAL PL. CHECK VALVE WAFER LUG		77.68.56					208.1	210.1	212.1		
GATE VALVE FLANGED		77.23.03	203.1	204.1	205.1	207.1					
GLOBE VALVE FLANGED		77.33.03	203.1	204.1	205.1	207.1	208.1	210.1	212.1		
MONOFL SINGLE BLOCK BALL		77.03.90	163.1	164.1	165.1	167.1	168.1				
* 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		76.64.96	082.1	084.1	086.1	088.1					
ORIFICE FLANGE SET		76.65.92					610.1	612.1	614.1	616.1	618.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.568.1	33.72.568.1	33.85.620.1
25* 15		33.70.578.1	33.72.578.1	33.85.630.1
25* 20		33.70.588.1	33.72.588.1	33.85.640.1
40* 15		33.70.605.1	33.72.605.1	33.85.645.1
40* 20		33.70.623.1	33.72.623.1	33.85.653.1
40* 25		33.70.633.1	33.72.633.1	33.85.661.1
50* 20		36.50.104.1	36.63.104.1	33.85.669.1
50* 25		33.70.639.1	33.72.639.1	33.85.679.1
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

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	141.1	632.1
	200-200	142.1	634.1
20	40- 80	143.1	636.1
	100-200	144.1	638.1
25	40- 40	145.1	639.1
	50- 50	146.1	640.1
	80-100	147.1	641.1
	150-200	148.1	642.1
40	50-100	170.1	658.1
	150-200	171.1	660.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.61.522.1			230 76.83.37.501.1
813	76.80.61.524.1			255 76.83.37.502.1
1219	76.80.61.526.1			305 76.83.37.503.1
1524	76.80.61.528.1			355 76.83.37.505.1
1829	76.80.61.530.1			405 76.83.37.506.1
2134	76.80.61.532.1			455 76.83.37.507.1
2438	76.80.61.534.1			
2743	76.80.61.536.1			
3048	76.80.61.538.1			

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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
20	4	3/4	*	120	61.332.1	20	4	3/4	*	120
25	4	7/8	*	130	61.403.1	25	4	7/8	*	130
40	4	1	*	140	61.469.1	40	4	1	*	140
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					

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

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	61.417.1
80	8	1 1/8	*	270	61.558.1
100	8	1 1/4	*	300	61.610.1
150	12	1 3/8	*	430	61.671.1
200	12	1 5/8	*	560	83.357.1

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.163.1
WELDING NECK FLANGE    1  76.65.80.602.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.164.1
WELDING NECK FLANGE    1  76.65.80.604.1

```

* DRAIN POINT	DN 20	FIG.DE	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		
MONOFL SINGLE BLOCK BALL	1	77.03.90.164.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -200
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.563.1
WELDING NECK FLANGE       2  76.65.80.602.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.563.1
WELDING NECK FLANGE               1  76.65.80.602.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.563.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1
WELDING NECK FLANGE        1  76.65.80.602.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1

```

```

* 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                   1  76.83.37.501.1
                                L=230 MM

```

```

* 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                   1   76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.93.043.1
WELDING NECK FLANGE         1  76.65.80.602.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.93.044.1
WELDING NECK FLANGE         1  76.65.80.604.1

```

* VENT POINT	DN 20	FIG.DE	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
MONOFL SINGLE BLOCK NEEDLE	1	77.33	93.044.1

CLASS 153420

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-20	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -200	222.3	222.3	220.4	216.3	210.9	203.4

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2 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.
- FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCHSIZE							
	15	20	25	40	50	80	100	150

200	C	C	C	C	E	E	B	B A
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	80S
20	80S
25	80S
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.

STAINLESS STEEL AISI 316, SOUR	PLANT :	
CLASS NO. : 153420	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-200	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316 (L), NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-200	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316 (L), NYLON
CHVF	CHECK VALVE FLANGED	DN 15-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	BODY: ASTM A351-CF8M,A182-F316 TRIM: AISI 316 (L), STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316,A351-CF8M TRIM: AISI 316

* 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 A182-F316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	020.1	028.1	036.1	054.1	063.1	071.1	079.1	088.1	100.1
* FLANGES										
BLIND FLANGE	76.65.10	500.1	501.1	502.1	503.1	504.1	505.1	506.1	507.1	508.1
SPECTACLE BLIND FLANGE	76.88.10	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	608.1	612.1	616.1	618.1	620.1	622.1	624.1	626.1	628.1
WELDING NECK FLANGE	76.65.80	602.1	604.1	606.1	611.1	610.1	612.1	614.1	616.1	618.1
* FITTINGS										
CAP BUTT-WELD.END	76.33.19	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	788.1	798.1	808.1	830.1	840.1	860.1	880.1	899.1	913.1
* VALVES										
BALL VALVE FULL BORE TRUN FLGD	77.03.74					708.1	710.1	712.1	714.1	715.1
BALL VALVE RED. BORE TRUN FLGD	77.03.74					208.1	210.1	212.1	214.1	215.1
CHECK VALVE FLANGED	77.13.03	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					208.1	210.1	212.1	214.1	215.1
GATE VALVE FLANGED	77.23.03	203.1	204.1	205.1	207.1					
GLOBE VALVE FLANGED	77.33.03	203.1	204.1	205.1	207.1	208.1	210.1	212.1		
MONOFL SINGLE BLOCK BALL	77.03.90	163.1	164.1	165.1	167.1	168.1				
* 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	76.64.96	082.1	084.1	086.1	088.1					
ORIFICE FLANGE SET	76.65.92					610.1	612.1	614.1	616.1	618.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.568.1	33.72.568.1	33.85.620.1
25* 15		33.70.578.1	33.72.578.1	33.85.630.1
25* 20		33.70.588.1	33.72.588.1	33.85.640.1
40* 15		33.70.605.1	33.72.605.1	33.85.645.1
40* 20		33.70.623.1	33.72.623.1	33.85.653.1
40* 25		33.70.633.1	33.72.633.1	33.85.661.1
50* 20		36.50.104.1	36.63.104.1	33.85.669.1
50* 25		33.70.639.1	33.72.639.1	33.85.679.1
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

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	141.1	632.1
	200-200	142.1	634.1
20	40- 80	143.1	636.1
	100-200	144.1	638.1
25	40- 40	145.1	639.1
	50- 50	146.1	640.1
	80-100	147.1	641.1
	150-200	148.1	642.1
40	50-100	170.1	658.1
	150-200	171.1	660.1

LEVEL DISPLACER CHAMBER			THERMOWELL	
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----			-----	-----
356	76.80.61.522.1		230	76.83.37.501.1
813	76.80.61.524.1		255	76.83.37.502.1
1219	76.80.61.526.1		305	76.83.37.503.1
1524	76.80.61.528.1		355	76.83.37.505.1
1829	76.80.61.530.1		405	76.83.37.506.1
2134	76.80.61.532.1		455	76.83.37.507.1
2438	76.80.61.534.1			
2743	76.80.61.536.1			
3048	76.80.61.538.1			

BOLTSET METER-RUN

BOLTSET SPECTACLE/SPACERBOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	66.417.1
80	8	1/8	*	270	66.550.1
100	8	1/4	*	300	66.610.1
150	12	3/8	*	430	66.671.1
200	12	5/8	*	560	86.357.1

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* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1
```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.93.043.1
WELDING NECK FLANGE         1  76.65.80.602.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.93.044.1
WELDING NECK FLANGE         1  76.65.80.604.1

```

* VENT POINT	DN 20	FIG.DE	DN 50	-200
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.65	10.50	1.1
GASKET, SPIRAL WOUND	2	85.41	46.50	6.1
MONOFL SINGLE BLOCK NEEDLE	1	77.33	93.04	4.1

CLASS 153430

DESIGN LIMITS								
TEMPERATURE IN DEGREES CELSIUS								
	-20	0	50	75	100	120	150	200

	PRESSURE BAR GA							
DN15 -100	248.2	248.2	240.5	224.8	210.9	203.4	192.4	178.4
DN150-150	236.6	236.6	236.6	224.8	210.9	203.4	192.4	178.4
DN200-200	228.4	228.4	228.4	224.8	210.9	203.4	192.4	178.4

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED

BRANCH CONNECTIONS 90 DEGREES										
BRANCHSIZE										
RUN SIZE	20		40		80		150			
	15	25	50	100	200					

200	C	C	C	C	E	E	B	B	A	
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	80S
20	80S
25	80S
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.

STAINLESS STEEL AISI 316	PLANT :	
CLASS NO. : 153430	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-200	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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-200	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 15-100	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-/SS INNER RING
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A182-F316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A350-LF2
ORFS	ORIFICE FLANGE SET	DN 50-200	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.33	020.1	028.1	036.1	054.1	063.1	071.1	079.1	088.1	100.1
* FLANGES										
BLIND FLANGE	76.65.10	500.1	501.1	502.1	503.1	504.1	505.1	506.1	507.1	508.1
SPECTACLE BLIND FLANGE	76.88.10	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1	528.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	608.1	612.1	616.1	618.1	620.1	622.1	624.1	626.1	628.1
WELDING NECK FLANGE	76.65.80	602.1	604.1	606.1	611.1	610.1	612.1	614.1	616.1	618.1
* FITTINGS										
CAP BUTT-WELD.END	76.33.19	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1	413.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	788.1	798.1	808.1	830.1	840.1	860.1	880.1	899.1	913.1
* VALVES										
CHECK VALVE FLANGED	77.13.03	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					208.1	210.1	212.1	214.1	215.1
GATE VALVE FLANGED	77.23.03	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1	215.1
GLOBE VALVE FLANGED	77.33.03	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	76.64.96	082.1	084.1	086.1	088.1					
ORIFICE FLANGE SET	76.65.92					610.1	612.1	614.1	616.1	618.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.568.1	33.72.568.1	33.85.620.1
25* 15		33.70.578.1	33.72.578.1	33.85.630.1
25* 20		33.70.588.1	33.72.588.1	33.85.640.1
40* 15		33.70.605.1	33.72.605.1	33.85.645.1
40* 20		33.70.623.1	33.72.623.1	33.85.653.1
40* 25		33.70.633.1	33.72.633.1	33.85.661.1
50* 20		36.50.104.1	36.63.104.1	33.85.669.1
50* 25		33.70.639.1	33.72.639.1	33.85.679.1
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

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	141.1	632.1
	200-200	142.1	634.1
20	40- 80	143.1	636.1
	100-200	144.1	638.1
25	40- 40	145.1	639.1
	50- 50	146.1	640.1
	80-100	147.1	641.1
	150-200	148.1	642.1
40	50-100	170.1	658.1
	150-200	171.1	660.1

LEVEL DISPLACER CHAMBER		THERMOWELL	
LENGTH	MESCNUMBER	LENGTH	MESCNUMBER
-----	-----	-----	-----
356	76.80.61.522.1	230	76.83.37.501.1
813	76.80.61.524.1	255	76.83.37.502.1
1219	76.80.61.526.1	305	76.83.37.503.1
1524	76.80.61.528.1	355	76.83.37.505.1
1829	76.80.61.530.1	405	76.83.37.506.1
2134	76.80.61.532.1	455	76.83.37.507.1
2438	76.80.61.534.1		
2743	76.80.61.536.1		
3048	76.80.61.538.1		

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 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	

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	61.417.1
80	8	1 1/8	*	270	61.558.1
100	8	1 1/4	*	300	61.610.1
150	12	1 3/8	*	430	61.671.1
200	12	1 5/8	*	560	83.357.1

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	76.65.10.500.1	
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	76.65.80.602.1	

* DRAIN POINT	DN 20	FIG.OI	DN 40 - 40
Branch:N ((N=br.tab,:S=BNIF,:=N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.65.10.501.1	
GASKET, SPIRAL WOUND	2	85.41.46.506.1	
GATE VALVE FLANGED	1	77.23.03.204.1	
STUD BOLT WITH NUTS	8	81.38.61.332.1	
WELDING NECK FLANGE	1	76.65.80.604.1	

* 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	81.38.61.332.1	

```

* ORIFICE INSTR.CONN.      DN 15  FTG.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  76.65.80.602.1

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* PRESSURE INSTR.CONN.      DN 15  FIG.01  DN 15 - 40
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
STUD BOLT WITH NUTS         4  81.38.61.330.1
                             4  81.38.61.330.1
WELDING NECK FLANGE         1  76.65.80.602.1

```

* PRESSURE INSTR.CONN.	DN 15	FTG.01	DN 50 -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	
WELDING NECK FLANGE	1	76.65.80.602.1	

```

* 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  85.41.46.504.1
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

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* 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                    1  76.83.37.501.1
                                L=230 MM

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* 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                   1  76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15 FIG.11    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    76.65.80.602.1

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* VENT POINT                      DN 20 FIG.11    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 81.38.61.332.1
WELDING NECK FLANGE              1 76.65.80.604.1

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* VENT POINT                DN 20  FIG.1H  DN 50 -200
Branch:S (:N=br.tab,:S=BNIF,:N/A) 1(PIPING.COM.)
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   81.38.61.332.1

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CLASS 153450

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-100	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -100	248.2	248.2	240.5	224.8	210.9	203.4
DN150-150	236.6	236.6	236.6	224.8	210.9	203.4

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE
- FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	80S
20	80S
25	80S
40	160
50	160
80	160
100	160
150	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.

STAINLESS STEEL LOW TEMP.	PLANT :	
CLASS NO. : 153450	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* 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 A182-F316
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-150	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-150	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
CHVF	CHECK VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-150	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316

* 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 A182-F316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE		74.36.33	020.1	028.1	036.1	054.1	063.1	071.1	079.1	088.1
PIPE NIPPLE 50MM		76.33.57	936.1	946.1	956.1	996.1				
* FLANGES										
BLIND FLANGE		76.65.10	500.1	501.1	502.1	503.1	504.1	505.1	506.1	507.1
SPECTACLE BLIND FLANGE		76.88.10	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1
SPACER RING TYPE (ASME FLANGE)		76.88.19	608.1	612.1	616.1	618.1	620.1	622.1	624.1	626.1
WELDING NECK FLANGE		76.65.80	602.1	604.1	606.1	611.1	610.1	612.1	614.1	616.1
* FITTINGS										
CAP BUTT-WELD.END		76.33.19	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1
ELBOW 45 DEG BUTT-WELD ENDS		76.33.37	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1
ELBOW 90 DEG BUTT-WELD ENDS		76.33.41	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1
EQUAL TEE BUTT-WELD ENDS		76.33.84	788.1	798.1	808.1	830.1	840.1	860.1	880.1	899.1
* VALVES										
BALL VALVE FULL BORE TRUN FLGD		77.03.73					708.1	710.1	712.1	714.1
BALL VALVE RED. BORE TRUN FLGD		77.03.73					208.1	210.1	212.1	214.1
CHECK VALVE FLANGED		77.13.19	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1
DUAL PL. CHECK VALVE WAFER LUG		77.68.56					208.1	210.1	212.1	214.1
GATE VALVE FLANGED		77.23.05	203.1	204.1	205.1	207.1				
GLOBE VALVE FLANGED		77.33.05	203.1	204.1	205.1	207.1	208.1	210.1	212.1	
MONOFL SINGLE BLOCK BALL		77.03.90	063.1	064.1	065.1	067.1	068.1			
* MISCELLANEOUS										
GASKET, SPIRAL WOUND		85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1
METER RUN		76.64.96	032.1	034.1	036.1	038.1				
ORIFICE FLANGE SET		76.65.92					610.1	612.1	614.1	616.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		33.70.568.1	33.72.568.1	33.85.620.1
25* 15		33.70.578.1	33.72.578.1	33.85.630.1
25* 20		33.70.588.1	33.72.588.1	33.85.640.1
40* 15		33.70.605.1	33.72.605.1	33.85.645.1
40* 20		33.70.623.1	33.72.623.1	33.85.653.1
40* 25		33.70.633.1	33.72.633.1	33.85.661.1
50* 20		36.50.104.1	36.63.104.1	33.85.669.1
50* 25		33.70.639.1	33.72.639.1	33.85.679.1
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

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	141.1	632.1
20	40- 80	143.1	636.1
	100-150	144.1	638.1
25	40- 40	145.1	639.1
	50- 50	146.1	640.1
	80-100	147.1	641.1
	150-150	148.1	642.1
40	50-100	170.1	658.1
	150-150	171.1	660.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.61.522.1			230 76.83.37.501.1
813	76.80.61.524.1			255 76.83.37.502.1
1219	76.80.61.526.1			305 76.83.37.503.1
1524	76.80.61.528.1			355 76.83.37.505.1
1829	76.80.61.530.1			405 76.83.37.506.1
2134	76.80.61.532.1			455 76.83.37.507.1
2438	76.80.61.534.1			
2743	76.80.61.536.1			
3048	76.80.61.538.1			

BOLTSET FLANGED JOINTS

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	*	120	63.332.1	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	1	1/8	*	180	63.533.1					
100	8	1	1/4	*	200	63.588.1					
150	12	1	3/8	*	260	63.649.1					

BOLTSET ORIFICE FLANGES

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

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	63.417.1
80	8	1/8	*	270	63.525.1
100	8	1/4	*	300	63.610.1
150	12	3/8	*	430	63.671.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL  1  77.03.90.063.1
WELDING NECK FLANGE  1  76.65.80.602.1

```

```
* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING.COM.)
BLIND FLANGE          1  76.65.10.501.1
GASKET, SPIRAL WOUND  2  85.41.46.506.1
MONOFL SINGLE BLOCK BALL  1  77.03.90.064.1
WELDING NECK FLANGE   1  76.65.80.604.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-150
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		
MONOFL SINGLE BLOCK BALL	1	77.03.90.064.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -150
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2      77.85.47.463.1
WELDING NECK FLANGE      2      76.65.80.602.1

```

```
* PI ON PIPING CL COUP   DN 15   FIG.CB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND           1   85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 1   77.85.47.463.1
WELDING NECK FLANGE           1   76.65.80.602.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.463.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.463.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.463.1
WELDING NECK FLANGE        1  76.65.80.602.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.463.1

```

```

* 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  76.65.60.787.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                  4  81.38.63.472.1
THERMOWELL TAPERED                   1  76.83.37.501.1
                                L=230 MM

```

```

* 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   76.65.60.787.1
GASKET, SPIRAL WOUND                 1   85.41.46.512.1
STUD BOLT WITH NUTS                  4   81.38.63.472.1
THERMOWELL TAPERED                   1   76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.92.043.1
WELDING NECK FLANGE       1  76.65.80.602.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.92.044.1
WELDING NECK FLANGE         1  76.65.08.604.1

```

```

* VENT POINT                      DN 20  FIG.DE  DN 50 -150
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
MONOFL SINGLE BLOCK NEEDLE        1  77.33.92.044.1

```

CLASS 153460

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS					
	-73	0	50	75	100	120

	PRESSURE BAR GA					
DN15 -150	222.3	222.3	220.4	216.3	210.9	203.4

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.2, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR DESIGN TEMPERATURES ABOVE 50 DEGR. C IN SALIFEROUS ATMOSPHERES, EXTERNAL PROTECTION IS REQUIRED TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - WHEN CHLORIDES ARE PRESENT IN CONJUNCTION WITH FREE OXYGEN IN THE PROCESS FLUID, THIS CLASS IS LIMITED TO AN UPPER DESIGN TEMPERATURE OF 50 DEGR. C, TO PREVENT CHLORIDE STRESS CORROSION CRACKING.
 - COLD BENDING OF PIPE IS NOT ALLOWED AND HOT BENDING IS NOT RECOMMENDED.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	80S
20	80S
25	80S
40	160
50	160
80	160
100	160
150	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.

STAINLESS STEEL LOW TEMP. SOUR	PLANT :	
CLASS NO. : 153460	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 153460, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-150	ASTM A312-TP316L

* FLANGES

BLFL	BLIND FLANGE	DN 15-150	ASTM A182-F316
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F316
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

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-150	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-150	BODY: ASTM A182-F316/A351-CF8M TRIM: AISI 316(L), PCTFE
CHVF	CHECK VALVE FLANGED	DN 15-150	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-150	BODY: ASTM A351-CF8M, A182-F316 TRIM: AISI 316(L), STELLITE 6
GAVF	GATE VALVE FLANGED	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
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F316, A351-CF8M TRIM: AISI 316

* 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 A182-F316
MTRR	METER RUN	DN 15- 40	MONEL 400 LJ END FLANGES: ASTM A182-F316
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A182-F316
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWTG	THERMOWELL TAPERED	DN 40- 40	MONEL 400

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE									
PIPE	74.36.33	020.1	028.1	036.1	054.1	063.1	071.1	079.1	088.1
* FLANGES									
BLIND FLANGE	76.65.10	500.1	501.1	502.1	503.1	504.1	505.1	506.1	507.1
SPECTACLE BLIND FLANGE	76.88.10	508.1	512.1	516.1	518.1	520.1	522.1	524.1	526.1
SPACER RING TYPE (ASME FLANGE)	76.88.19	608.1	612.1	616.1	618.1	620.1	622.1	624.1	626.1
WELDING NECK FLANGE	76.65.80	602.1	604.1	606.1	611.1	610.1	612.1	614.1	616.1
* FITTINGS									
CAP BUTT-WELD.END	76.33.19	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1
ELBOW 45 DEG BUTT-WELD ENDS	76.33.37	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1
ELBOW 90 DEG BUTT-WELD ENDS	76.33.41	288.1	298.1	308.1	330.1	340.1	360.1	380.1	399.1
EQUAL TEE BUTT-WELD ENDS	76.33.84	788.1	798.1	808.1	830.1	840.1	860.1	880.1	899.1
* VALVES									
BALL VALVE FULL BORE TRUN FLGD	77.03.73					708.1	710.1	712.1	714.1
BALL VALVE RED. BORE TRUN FLGD	77.03.73					208.1	210.1	212.1	214.1
CHECK VALVE FLANGED	77.13.19	203.1	204.1	205.1	207.1	208.1	210.1	212.1	214.1
DUAL PL. CHECK VALVE WAFER LUG	77.68.56					208.1	210.1	212.1	214.1
GATE VALVE FLANGED	77.23.05	203.1	204.1	205.1	207.1				
GLOBE VALVE FLANGED	77.33.05	203.1	204.1	205.1	207.1	208.1	210.1	212.1	
MONOFL SINGLE BLOCK BALL	77.03.90	163.1	164.1	165.1	167.1	168.1			
* MISCELLANEOUS									
GASKET, SPIRAL WOUND	85.41.46	504.1	506.1	508.1	512.1	514.1	518.1	520.1	524.1
METER RUN	76.64.96	032.1	034.1	036.1	038.1				
ORIFICE FLANGE SET	76.65.92					610.1	612.1	614.1	616.1

	BROB	RECB	REEB	TERB	
	76.	76.	76.	76.	
RUN* BR					.
20* 15		33.70.568.1	33.72.568.1	33.85.620.1	
25* 15		33.70.578.1	33.72.578.1	33.85.630.1	
25* 20		33.70.588.1	33.72.588.1	33.85.640.1	
40* 15		33.70.605.1	33.72.605.1	33.85.645.1	
40* 20		33.70.623.1	33.72.623.1	33.85.653.1	
40* 25		33.70.633.1	33.72.633.1	33.85.661.1	
50* 20		36.50.104.1	36.63.104.1	33.85.669.1	
50* 25		33.70.639.1	33.72.639.1	33.85.679.1	
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	

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	141.1	632.1
20	40- 80	143.1	636.1
	100-150	144.1	638.1
25	40- 40	145.1	639.1
	50- 50	146.1	640.1
	80-100	147.1	641.1
	150-150	148.1	642.1
40	50-100	170.1	658.1
	150-150	171.1	660.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
356	76.80.61.522.1			230 76.83.37.501.1
813	76.80.61.524.1			255 76.83.37.502.1
1219	76.80.61.526.1			305 76.83.37.503.1
1524	76.80.61.528.1			355 76.83.37.505.1
1829	76.80.61.530.1			405 76.83.37.506.1
2134	76.80.61.532.1			455 76.83.37.507.1
2438	76.80.61.534.1			
2743	76.80.61.536.1			
3048	76.80.61.538.1			

BOLTSET FLANGED JOINTS

81.38					81.38						
DN	NR	INCH	*	MM	DN	NR	INCH	*	MM		
15	4	3/4	*	110	67.330.1	15	4	3/4	*	110	67.330.1
20	4	3/4	*	120	67.332.1	20	4	3/4	*	120	67.332.1
25	4	7/8	*	130	67.403.1	25	4	7/8	*	130	67.403.1
40	4	1	*	140	67.469.1	40	4	1	*	140	67.469.1
50	8	7/8	*	150	67.406.1						
80	8	1 1/8	*	180	67.533.1						
100	8	1 1/4	*	200	67.588.1						
150	12	3/8	*	260	67.649.1						

BOLTSET ORIFICE FLANGES

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

BOLTSET WAFER CHECK VALVE

					81.38
DN	NR	INCH	*	MM	

50	8	7/8	*	220	67.417.1
80	8	1/8	*	270	67.546.1
100	8	1/4	*	300	67.610.1
150	12	3/8	*	430	67.670.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.163.1
WELDING NECK FLANGE    1  76.65.80.602.1

```

```

* DRAIN POINT          DN 20  FIG.DF  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
MONOFL SINGLE BLOCK BALL 1  77.03.90.164.1
WELDING NECK FLANGE    1  76.65.80.604.1

```

* DRAIN POINT	DN 20	FIG.DE	DN 50 -150
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	
MONOFL SINGLE BLOCK BALL	1	77.03.90.164.1	

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -150
Branch:  (:N=br.tab;:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.563.1
WELDING NECK FLANGE       2  76.65.80.602.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1      85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD    1      77.85.47.563.1
WELDING NECK FLANGE               1      76.65.80.602.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.563.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1    85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1
WELDING NECK FLANGE       1    76.65.80.602.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.41.46.504.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.563.1

```

```

* 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  76.65.60.787.1
GASKET, SPIRAL WOUND                 1  85.41.46.512.1
STUD BOLT WITH NUTS                   4  81.38.67.472.1
THERMOWELL TAPERED                   1  76.83.37.501.1
                                L=230 MM

```

```

* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -150
Branch:S (N=br.tab,S=BNIF,N=N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE      1   76.65.60.787.1
GASKET, SPIRAL WOUND                  1   85.41.46.512.1
STUD BOLT WITH NUTS                   4   81.38.67.472.1
THERMOWELL TAPERED                    1   76.83.37.502.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE  1  77.33.93.043.1
WELDING NECK FLANGE         1  76.65.80.602.1

```

```

* VENT POINT                DN 20  FIG.DF  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
MONOFL SINGLE BLOCK NEEDLE 1  77.33.93.044.1
WELDING NECK FLANGE        1  76.65.80.604.1

```

```

* VENT POINT                DN 20  FIG.DE  DN 50 -150
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
MONOFL SINGLE BLOCK NEEDLE 1  77.33/93.044.1

```


CLASS 153831

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 0 50 75 100 120

PRESSURE BAR GA
DN15 -400 258.5 258.5 256.2 251.6 245.9 239.1

NOTES

- - DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
- FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST
- WHERE TWO OPTIONS ARE GIVEN FOR PIPE, THE MOST ECONOMIC CHOICE SHOULD BE CHECKED WITH THE SUPPLIER

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	B	B	B	B	A
350	C	C	C	C	E	E	E	B	B	B	B	A	
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	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	80S
20	80S
25	80S
40	80S
50	80S
80	80S
100	80S
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.

DUPLEX, UNS S31803	PLANT :	
CLASS NO. : 153831	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 153831 , REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN250-400	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-400	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-400	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-400	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-400	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-400	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-400	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-400	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-400	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-400	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-400	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-400	ASTM A815-WP-S UNS S31803

* VALVES

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-400	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-400	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H
TWTG THERMOWELL TAPERED	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 153831 , REV.A PAGE 3
ISSUE DATE : DECEMBER 1998

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

* PIPE														
PIPE (WELDED)	74.36.57										174.1	191.1	208.1	223.1
PIPE	74.36.58	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	160.1	174.1	191.1	208.1	223.1
* FLANGES														
BLIND FLANGE	76.66.01	152.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1
SPECTACLE BLIND FLANGE	76.88.24	160.1	162.1	163.1	164.1	165.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1
SPADE BLIND	76.88.41	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)	76.88.23	412.1	414.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1	432.1	434.1	436.1
WELDING NECK FLANGE	76.66.29	686.1	688.1	690.1	692.1	694.1	802.1	804.1	830.1	832.1	834.1	836.1	838.1	840.1
* FITTINGS														
CAP BUTT-WELD.END	76.36.05	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	160.1	174.1	191.1	208.1	223.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	160.1	174.1	191.1	208.1	223.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	160.1	174.1	191.1	208.1	223.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	160.1	174.1	191.1	208.1	223.1
* VALVES														
BALL VALVE FULL BORE TRUN FLGD	77.03.81					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
CHECK VALVE FLANGED	77.13.41	203.1	204.1	205.1	207.1									
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1
GATE VALVE FLANGED	77.23.41	203.1	204.1	205.1	207.1									
GLOBE VALVE FLANGED	77.33.41	203.1	204.1	205.1	207.1	208.1	210.1	212.1						
MONOFL SINGLE BLOCK BALL	77.03.92	463.1	464.1	465.1	467.1	468.1								
* MISCELLANEOUS														
GASKET, SPIRAL WOUND	85.43.58	204.1	206.1	208.1	212.1	214.1	218.1	220.1	224.1	226.1	228.1	230.1	232.1	234.1
METER RUN	76.65.96	652.1	654.1	656.1	658.1									
ORIFICE FLANGE SET	76.66.90					660.1	694.1	696.1	754.1	756.1	758.1	760.1	762.1	764.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	.								
20* 15		36.43.004.1	36.58.004.1	36.83.004.1	400* 50	78.50.498.1			
25* 15		36.43.022.1	36.58.022.1	36.83.022.1	400* 80	78.50.522.1			
25* 20		36.43.038.1	36.58.038.1	36.83.038.1	400*100	78.50.544.1			
40* 15		36.43.054.1	36.58.054.1	36.83.054.1	400*150	78.50.878.1			
40* 20		36.43.072.1	36.58.072.1	36.83.072.1	400*200		36.43.635.1	36.58.635.1	36.83.635.1
40* 25		36.43.088.1	36.58.088.1	36.83.088.1	400*250		36.43.655.1	36.58.655.1	36.83.655.1
50* 20		36.43.104.1	36.58.104.1	36.83.104.1	400*300		36.43.671.1	36.58.671.1	36.83.671.1
50* 25		36.43.122.1	36.58.122.1	36.83.122.1	400*350		36.43.689.1	36.58.689.1	36.83.689.1
50* 40		36.43.138.1	36.58.138.1	36.83.138.1					
80* 40		36.43.154.1	36.58.154.1	36.83.154.1					
80* 50		36.43.172.1	36.58.172.1	36.83.172.1					
100* 40		36.43.188.1	36.58.188.1	36.83.188.1					
100* 50		36.43.207.1	36.58.207.1	36.83.207.1					
100* 80		36.43.226.1	36.58.226.1	36.83.226.1					
150* 50	78.50.488.1								
150* 80		36.43.253.1	36.58.253.1	36.83.253.1					
150*100		36.43.271.1	36.58.271.1	36.83.271.1					
200* 50	78.50.490.1								
200* 80	78.50.514.1								
200*100		36.43.295.1	36.58.295.1	36.83.295.1					
200*150		36.43.307.1	36.58.307.1	36.83.307.1					
250* 50	78.50.492.1								
250* 80	78.50.516.1								
250*150		36.43.354.1	36.58.354.1	36.83.354.1					
250*200		36.43.382.1	36.58.382.1	36.83.382.1					
300* 50	78.50.494.1								
300* 80	78.50.518.1								
300*100	78.50.540.1								
300*150		36.43.416.1	36.58.416.1	36.83.416.1					
300*200		36.43.444.1	36.58.444.1	36.83.444.1					
300*250		36.43.478.1	36.58.478.1	36.83.478.1					
350* 50	78.50.496.1								
350* 80	78.50.520.1								
350*100	78.50.542.1								
350*150		36.43.511.1	36.58.511.1	36.83.511.1					
350*200		36.43.538.1	36.58.538.1	36.83.538.1					
350*250		36.43.571.1	36.58.571.1	36.83.571.1					
350*300		36.43.604.1	36.58.604.1	36.83.604.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
15	40-150	341.1	272.1
	200-400	342.1	274.1
20	40- 80	343.1	276.1
	100-400	344.1	278.1
25	40- 40	345.1	279.1
	50- 50	346.1	280.1
	80-100	347.1	281.1
	150-400	348.1	282.1
40	50- 50	350.1	284.1
	80- 80	351.1	285.1
	100-100	352.1	286.1
	150-300	353.1	287.1
	350-400	354.1	288.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.62.482.1		230	76.83.36.261.1
813	76.80.62.484.1		255	76.83.36.262.1
1219	76.80.62.486.1		305	76.83.36.263.1
1524	76.80.62.488.1		355	76.83.36.265.1
1829	76.80.62.490.1		405	76.83.36.266.1
2134	76.80.62.492.1		455	76.83.36.267.1
2438	76.80.62.494.1			
2743	76.80.62.496.1			
3048	76.80.62.498.1			

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

BOLTSET FLANGED JOINTS

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	3/8	*	280	61.652.1		150	12	3/8	*	300	61.655.1
200	12	5/8	*	360	61.736.1		200	12	5/8	*	400	61.741.1
250	12	7/8	*	420	61.802.1		250	12	7/8	*	460	61.806.1
300	16		*	460	61.834.1		300	16		*	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

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	61.417.1
80	8	1 1/8	* 270	61.558.1
100	8	1 1/4	* 300	61.610.1
150	12	3/8	* 430	61.671.1
200	12	5/8	* 560	83.357.1
250	12	7/8	* 640	83.505.1
300	16		* 740	83.585.1
350	16	1/4	* 830	83.663.1
400	16	1/2	* 890	83.737.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE           1  76.66.01.152.1
GASKET, SPIRAL WOUND   2  85.43.58.204.1
MONOFL SINGLE BLOCK BALL 1  77.03.92.463.1
WELDING NECK FLANGE    1  76.66.29.686.1

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```
* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COM.)
BLIND FLANGE          1  76.66.01.154.1
GASKET, SPIRAL WOUND  2  85.43.58.206.1
MONOFL SINGLE BLOCK BALL  1  77.03.92.464.1
WELDING NECK FLANGE   1  76.66.29.688.1
```

* DRAIN POINT	DN 20	FIG.DE	DN 50	-500
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)		
BLIND FLANGE	1	76.66.01.154.1		
GASKET, SPIRAL WOUND	2	85.43.58.206.1		
MONOFL SINGLE BLOCK BALL	1	77.03.92.464.1		

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -500
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.863.1
WELDING NECK FLANGE        2  76.66.29.686.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD    1  77.85.47.863.1
WELDING NECK FLANGE               1  76.66.29.686.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -500
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
```

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```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.863.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.863.1
WELDING NECK FLANGE       1      76.66.29.686.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -500
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1

```

```

* 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      76.65.61.018.1
GASKET, SPIRAL WOUND                 1      85.43.58.212.1
STUD BOLT WITH NUTS                   4      81.38.61.472.1
THERMOWELL TAPERED                    L=230 MM      1      76.83.36.261.1

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```

* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -500
Branch:S (N=br.tab,S=BNIF,N=A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE      1  76.65.61.018.1
GASKET, SPIRAL WOUND                 1  85.43.58.212.1
STUD BOLT WITH NUTS                   4  81.38.61.472.1
THERMOWELL TAPERED                   1  76.83.36.262.1
                                L=255 MM

```

```

* VENT POINT                      DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                      1  76.66.01.152.1
GASKET, SPIRAL WOUND              2  85.43.58.204.1
MONOFL SINGLE BLOCK NEEDLE       1  77.33.46.043.1
WELDING NECK FLANGE              1  76.66.29.686.1

```

```

* VENT POINT                DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.154.1
GASKET, SPIRAL WOUND        2  85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE  1  77.33.46.044.1
WELDING NECK FLANGE         1  76.66.29.688.1

```

* VENT POINT	DN 20	FIG.DE	DN 50 -500
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.154.1	
GASKET, SPIRAL WOUND	2	85.43.58.206.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.044.1	

CLASS 153832

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 120

PRESSURE BAR GA
DN15 -500 222.3 222.3

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - WHERE TWO OPTIONS ARE GIVEN FOR PIPE, THE MOST ECONOMIC CHOICE SHOULD BE CHECKED WITH THE SUPPLIER

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			
500	C	C	C	C	E	E	E	E	E	B	B	B	B	B	A	15	80S	
450	C	C	C	C	E	E	E	E	B	B	B	B	B	B	A	20	80S	
400	C	C	C	C	E	E	E	E	B	B	B	B	A			25	80S	
350	C	C	C	C	E	E	E	B	B	B	A					40	80S	
300	C	C	C	C	E	E	E	B	B	B	A					50	80S	
250	C	C	C	C	E	E	E	B	B	A						80	80S	
200	C	C	C	C	E	E	B	B	A							100	80S	
150	C	C	C	C	E	B	B	A								150	120	
100	C	C	C	B	B	B	A									200	100	
80	C	C	C	B	B	A										250	100	
50	C	B	B	B	A											300	100	
40	B	B	B	A												350	100	
25	B	B	A													400	100	
20	B	A														450	100	
15	A															500	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.

DUPLEX, UNS S31803, SOUR	PLANT :	
CLASS NO. : 153832	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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* PIPE

PIPD PIPE (WELDED)	DN250-500	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-250	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-500	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-500	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-500	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-500	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-250	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-500	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-500	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-500	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-500	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-500	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-500	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-500	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-500	ASTM A815-WP-S UNS S31803

* VALVES

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-400	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-500	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-500	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-500	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM
TWTG THERMOWELL TAPERED	DN 40- 40	ASTM A182-F51

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

* PIPE																
PIPE (WELDED)	74.36.57										173.1	190.1	207.1	222.1	240.1	254.1
PIPE	74.36.58	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1					
* FLANGES																
BLIND FLANGE	76.66.01	152.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1
SPECTACLE BLIND FLANGE	76.88.24	160.1	162.1	163.1	164.1	165.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1	182.1	184.1
SPADE BLIND	76.88.41	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	188.1	190.1
SPACER RING TYPE (ASME FLANGE)	76.88.23	412.1	414.1	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
WELDING NECK FLANGE	76.66.29	686.1	688.1	690.1	692.1	694.1	802.1	804.1	830.1	890.1	892.1					
* FITTINGS																
CAP BUTT-WELD.END	76.36.05	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1	190.1	207.1	222.1	240.1	254.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1	190.1	207.1	222.1	240.1	254.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1	190.1	207.1	222.1	240.1	254.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1	190.1	207.1	222.1	240.1	254.1
* VALVES																
BALL VALVE FULL BORE TRUN FLGD	77.03.81					708.1	710.1	712.1	714.1	715.1	716.1	717.1	718.1	719.1		
BALL VALVE RED. BORE TRUN FLGD	77.03.81					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1		
CHECK VALVE FLANGED	77.13.41	203.1	204.1	205.1	207.1											
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					208.1	210.1	212.1	214.1	215.1	216.1	217.1	218.1	219.1	220.1	221.1
GATE VALVE FLANGED	77.23.41	203.1	204.1	205.1	207.1											
GLOBE VALVE FLANGED	77.33.41	203.1	204.1	205.1	207.1	208.1	210.1	212.1								
MONOFL SINGLE BLOCK BALL	77.03.92	463.1	464.1	465.1	467.1	468.1										
* MISCELLANEOUS																
GASKET, SPIRAL WOUND	85.43.58	204.1	206.1	208.1	212.1	214.1	218.1	220.1	224.1	226.1	228.1	230.1	232.1	234.1	236.1	238.1
METER RUN	76.65.96	652.1	654.1	656.1	658.1											
ORIFICE FLANGE SET	76.66.90					660.1	694.1	696.1	754.1	793.1	794.1	795.1	796.1	797.1	798.1	799.1

	BROB	RECB	REEB	TERB		BROB	RECB	REEB	TERB
	76.	76.	76.	76.		76.	76.	76.	76.
RUN* BR	-----								
20* 15		36.43.004.1	36.58.004.1	36.83.004.1	400* 50	78.51.005.1			
25* 15		36.43.022.1	36.58.022.1	36.83.022.1	400* 80	78.51.014.1			
25* 20		36.43.038.1	36.58.038.1	36.83.038.1	400*100	78.51.023.1			
40* 15		36.43.054.1	36.58.054.1	36.83.054.1	400*150	78.51.060.1			
40* 20		36.43.072.1	36.58.072.1	36.83.072.1	400*200		36.43.637.1	36.58.644.1	36.83.637.1
40* 25		36.43.088.1	36.58.088.1	36.83.088.1	400*250		36.43.654.1	36.58.654.1	36.83.654.1
50* 20		36.43.104.1	36.58.104.1	36.83.104.1	400*300		36.43.674.1	36.58.674.1	36.83.674.1
50* 25		36.43.122.1	36.58.122.1	36.83.122.1	400*350		36.43.691.1	36.58.691.1	36.83.691.1
50* 40		36.43.138.1	36.58.138.1	36.83.138.1	450* 50	78.51.006.1			
80* 40		36.43.154.1	36.58.154.1	36.83.154.1	450* 80	78.51.015.1			
80* 50		36.43.172.1	36.58.172.1	36.83.172.1	450*100	78.51.024.1			
100* 40		36.43.188.1	36.58.188.1	36.83.188.1	450*150	78.51.062.1			
100* 50		36.43.207.1	36.58.207.1	36.83.207.1	450*200			36.83.705.1	
100* 80		36.43.226.1	36.58.226.1	36.83.226.1	450*250		36.43.720.1	36.58.720.1	36.83.720.1
150* 50	78.50.488.1				450*300		36.43.737.1	36.58.737.1	36.83.737.1
150* 80		36.43.253.1	36.58.253.1	36.83.253.1	450*350		36.43.755.1	36.58.755.1	36.83.755.1
150*100		36.43.271.1	36.58.271.1	36.83.271.1	450*400		36.43.772.1	36.58.772.1	36.83.772.1
200* 50	78.51.001.1				500* 50	78.51.007.1			
200* 80	78.51.010.1				500* 80	78.51.016.1			
200*100		36.43.291.1	36.58.291.1	36.83.294.1	500*100	78.51.025.1			
200*150		36.43.321.1	36.58.321.1	36.83.318.1	500*150	78.51.063.1			
250* 50	78.51.002.1				500*200	78.51.030.1			
250* 80	78.51.011.1				500*250			36.83.805.1	
250*100	78.51.020.1				500*300		36.43.822.1	36.58.822.1	36.83.822.1
250*150		36.43.364.1	36.58.364.1	36.83.365.1	500*350		36.43.840.1	36.58.840.1	36.83.840.1
250*200		36.43.381.1	36.58.381.1	36.83.381.1	500*400		36.43.857.1	36.58.857.1	36.83.857.1
300* 50	78.51.003.1				500*450		36.43.874.1	36.58.874.1	36.83.874.1
300* 80	78.51.012.1								
300*100	78.51.021.1								
300*150		36.43.428.1	36.58.428.1	36.83.427.1					
300*200		36.43.443.1	36.58.443.1	36.83.443.1					
300*250		36.43.477.1	36.58.477.1	36.83.477.1					
350* 50	78.51.004.1								
350* 80	78.51.013.1								
350*100	78.51.022.1								
350*150		36.43.521.1	36.58.521.1	36.83.522.1					
350*200		36.43.537.1	36.58.537.1	36.83.537.1					
350*250		36.43.570.1	36.58.570.1	36.83.570.1					
350*300		36.43.603.1	36.58.603.1	36.83.603.1					

		BNIF	BNIP
		76.80.35	76.80.34
BRANCH	RUN-PIPE	-----	
15	40-150	341.1	272.1
	200-500	342.1	274.1
20	40- 80	343.1	276.1
	100-500	344.1	278.1
25	40- 40	345.1	279.1
	50- 50	346.1	280.1
	80-100	347.1	281.1
	150-500	348.1	282.1
40	50- 50	350.1	284.1
	80- 80	351.1	285.1
	100-100	352.1	286.1
	150-300	353.1	287.1
	350-500	354.1	288.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER		LENGTH	MESCNUMBER
-----	-----		-----	-----
356	76.80.62.482.1		230	76.83.36.261.1
813	76.80.62.484.1		255	76.83.36.262.1
1219	76.80.62.486.1		305	76.83.36.263.1
1524	76.80.62.488.1		355	76.83.36.265.1
1829	76.80.62.490.1		405	76.83.36.266.1
2134	76.80.62.492.1		455	76.83.36.267.1
2438	76.80.62.494.1			
2743	76.80.62.496.1			
3048	76.80.62.498.1			

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
20	4	3/4	*	120	66.332.1	20	4	3/4	*	120
25	4	7/8	*	130	66.403.1	25	4	7/8	*	130
40	4	1	*	140	66.469.1	40	4	1	*	140
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					
450	16	2 3/4	*	580	86.779.1					
500	16	3	*	640	86.855.1					

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	3/8	*	280	150	12	3/8	*	300
200	12	5/8	*	360	200	12	5/8	*	400
250	12	7/8	*	420	250	12	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
450	16	2 3/4	*	600	450	16	2 3/4	*	680
500	16	3	*	660	500	16	3	*	750

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	
50	8	7/8	* 220	66.417.1
80	8	1/8	* 270	66.550.1
100	8	1/4	* 300	66.610.1
150	12	3/8	* 430	66.671.1
200	12	5/8	* 560	86.357.1
250	12	7/8	* 640	86.505.1
300	16	2	* 740	86.585.1
350	16	2 1/4	* 830	86.663.1
400	16	2 1/2	* 890	86.737.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE           1  76.66.01.152.1
GASKET, SPIRAL WOUND   2  85.43.58.204.1
MONOFL SINGLE BLOCK BALL 1  77.03.92.463.1
WELDING NECK FLANGE    1  76.66.29.686.1

```

```

* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE           1  76.66.01.154.1
GASKET, SPIRAL WOUND   2  85.43.58.206.1
MONOFL SINGLE BLOCK BALL 1  77.03.92.464.1
WELDING NECK FLANGE    1  76.66.29.688.1

```

```

* DRAIN POINT          DN 20  FIG.DE  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE           1  76.66.01.154.1
GASKET, SPIRAL WOUND   2  85.43.58.206.1
MONOFL SINGLE BLOCK BALL 1  77.03.92.464.1

```

```
* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -600
Branch:  (:N=br.tab,:S=BNIF,:N=A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.863.1
WELDING NECK FLANGE       2  76.66.29.686.1
```

```

* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND              1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD    1      77.85.47.863.1
WELDING NECK FLANGE               1      76.66.29.686.1

```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
```

```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.863.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
WELDING NECK FLANGE       1  76.66.29.686.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1

```

```

* 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      76.65.61.018.1
GASKET, SPIRAL WOUND                 1      85.43.58.212.1
STUD BOLT WITH NUTS                   4      81.38.66.472.1
THERMOWELL TAPERED                    L=230 MM      1      76.83.36.261.1

```

```

* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -6000
Branch:S (N=br.tab,S=BNIF,=N/A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE      1   76.65.61.018.1
GASKET, SPIRAL WOUND                 1   85.43.58.212.1
STUD BOLT WITH NUTS                  4   81.38.66.472.1
THERMOWELL TAPERED                   1   76.83.36.262.1
                                L=255 MM

```

```

* VENT POINT                      DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                      1  76.66.01.152.1
GASKET, SPIRAL WOUND              2  85.43.58.204.1
MONOFL SINGLE BLOCK NEEDLE       1  77.33.46.043.1
WELDING NECK FLANGE              1  76.66.29.686.1

```

```

* VENT POINT                DN 20  FIG.DF  DN 40 - 40
Branch:N (N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.154.1
GASKET, SPIRAL WOUND        2  85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.044.1
WELDING NECK FLANGE         1  76.66.29.688.1

```

```

* VENT POINT                DN 20  FIG.DE  DN 50 -600
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE                1    76.66.01.154.1
GASKET, SPIRAL WOUND        2    85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1    77.33.46.044.1

```

CLASS 153833

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS					
-50	50	75	100	120	
PRESSURE BAR GA					
DN15 -250	253.9	253.9	251.6	245.9	239.1

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
- FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
- FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST
- WHERE TWO OPTIONS ARE GIVEN FOR PIPE, THE MOST ECONOMIC CHOICE SHOULD BE CHECKED WITH THE SUPPLIER

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE									
	15	20	25	40	50	80	100	150	200	250
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	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	80S
20	80S
25	80S
40	80S
50	80S
80	80S
100	80S
150	120
200	100
250	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.

DUPLEX, UNS S31803, LOW TEMP	PLANT :	
CLASS NO. : 153833	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 153833, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPD	PIPE (WELDED)	DN250-250	ASTM A928-CL1	UNS S31803
PIPE	PIPE	DN 15-250	ASTM A790	UNS S31803

* FLANGES

BLFL	BLIND FLANGE	DN 15-250	ASTM A182-F51	
COFL	COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51	
SBFL	SPECTACLE BLIND FLANGE	DN 15-250	ASTM A240	UNS S31803
SPFL	SPADE BLIND	DN 15-250	ASTM A240	UNS S31803
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-250	ASTM A240	UNS S31803
WNFL	WELDING NECK FLANGE	DN 15-250	ASTM A182-F51	

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-250	ASTM A815-WP-S	UNS S31803
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S	UNS S31803
		DN150-250	ASTM A815-WP-S/WX	UNS S31803
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S	UNS S31803
		DN150-250	ASTM A815-WP-S/WX	UNS S31803
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-250	ASTM A815-WP-S	UNS S31803

* REDUCING FITTINGS

BNIF	BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51	
BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51	
BROB	BRANCH OUTLET RED. BUTT WELD	DN150-250	ASTM A182-F51	
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S	UNS S31803
		DN150-250	ASTM A815-WP-S/WX	UNS S31803
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S	UNS S31803
		DN150-250	ASTM A815-WP-S/WX	UNS S31803
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-250	ASTM A815-WP-S	UNS S31803

* VALVES

BNFF	BALL VALVE FB TRUNNION NON EXT	DN 50-250	BODY: ASTM A890-4A,A182-F51
			TRIM: DUPLEX,NYLON
BNRF	BALL VALVE RB TRUNNION NON EXT	DN 50-250	BODY: ASTM A890-4A,A182-F51
			TRIM: DUPLEX,NYLON
BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-250	BODY: ASTM A890-4A,A182-F51
			TRIM: DUPLEX,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-250	BODY: ASTM A890-4A,A182-F51
			TRIM: DUPLEX,NYLON
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51
			TRIM: DUPLEX
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-250	BODY: ASTM A890-4A,A182-F51
			TRIM: DUPLEX
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51
			TRIM: DUPLEX
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A890-4A,A182-F51
			TRIM: DUPLEX
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51
			TRIM: ASTM A182-F51,AISI 316
MSNf	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51
			TRIM: ASTM A182-F51,AISI 316,
			STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51
			TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-250	INCONEL 600,GRAPHITE FILLED	
			DUPLEX CENTRING/INNER RING	
LDPC	LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790	UNS S31803,A182-F51
MTRR	METER RUN	DN 15- 40	ASTM A790	UNS S31803,A182-F51
ORFS	ORIFICE FLANGE SET	DN 50-250	ASTM A182-F51	
STBT	STUD BOLT WITH NUTS	---	ASTM A320-L7/A194-4	
TWTG	THERMOWELL TAPERED	DN 40- 40	ASTM A182-F51	

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE											
PIPE (WELDED)	74.36.57										173.1
PIPE	74.36.58	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
* FLANGES											
BLIND FLANGE	76.66.01	152.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1
SPECTACLE BLIND FLANGE	76.88.24	160.1	162.1	163.1	164.1	165.1	166.1	168.1	170.1	172.1	174.1
SPADE BLIND	76.88.41	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1
SPACER RING TYPE (ASME FLANGE)	76.88.23	412.1	414.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1
WELDING NECK FLANGE	76.66.29	686.1	688.1	690.1	692.1	694.1	802.1	804.1	830.1	890.1	892.1
* FITTINGS											
CAP BUTT-WELD.END	76.36.05	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
* VALVES											
BALL VALVE FB TRUNNION NON EXT	77.03.86					708.1	710.1	712.1	714.1	715.1	716.1
BALL VALVE RB TRUNNION NON EXT	77.03.86					208.1	210.1	212.1	214.1	215.1	216.1
BALL VALVE FULL BORE TRUN FLGD	77.03.81					708.1	710.1	712.1	714.1	715.1	716.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					208.1	210.1	212.1	214.1	215.1	216.1
CHECK VALVE FLANGED	77.13.41	203.1	204.1	205.1	207.1						
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					208.1	210.1	212.1	214.1	215.1	216.1
GATE VALVE FLANGED	77.23.41	203.1	204.1	205.1	207.1						
GLOBE VALVE FLANGED	77.33.41	203.1	204.1	205.1	207.1	208.1	210.1	212.1			
MONOFL SINGLE BLOCK BALL	77.03.92	463.1	464.1	465.1	467.1	468.1					
* MISCELLANEOUS											
GASKET, SPIRAL WOUND	85.43.58	204.1	206.1	208.1	212.1	214.1	218.1	220.1	224.1	226.1	228.1
METER RUN	76.65.96	652.1	654.1	656.1	658.1						
ORIFICE FLANGE SET	76.66.90					660.1	694.1	696.1	754.1	793.1	794.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		36.43.004.1	36.58.004.1	36.83.004.1
25* 15		36.43.022.1	36.58.022.1	36.83.022.1
25* 20		36.43.038.1	36.58.038.1	36.83.038.1
40* 15		36.43.054.1	36.58.054.1	36.83.054.1
40* 20		36.43.072.1	36.58.072.1	36.83.072.1
40* 25		36.43.088.1	36.58.088.1	36.83.088.1
50* 20		36.43.104.1	36.58.104.1	36.83.104.1
50* 25		36.43.122.1	36.58.122.1	36.83.122.1
50* 40		36.43.138.1	36.58.138.1	36.83.138.1
80* 40		36.43.154.1	36.58.154.1	36.83.154.1
80* 50		36.43.172.1	36.58.172.1	36.83.172.1
100* 40		36.43.188.1	36.58.188.1	36.83.188.1
100* 50		36.43.207.1	36.58.207.1	36.83.207.1
100* 80		36.43.226.1	36.58.226.1	36.83.226.1
150* 50	78.50.488.1			
150* 80		36.43.253.1	36.58.253.1	36.83.253.1
150*100		36.43.271.1	36.58.271.1	36.83.271.1
200* 50	78.51.001.1			
200* 80	78.51.010.1			
200*100		36.43.291.1	36.58.291.1	36.83.294.1
200*150		36.43.321.1	36.58.321.1	36.83.318.1
250* 50	78.51.002.1			
250* 80	78.51.011.1			
250*100	78.51.020.1			
250*150		36.43.364.1	36.58.364.1	36.83.365.1
250*200		36.43.381.1	36.58.381.1	36.83.381.1

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
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
-----	-----	-----	-----
15	40-150	341.1	272.1
	200-250	342.1	274.1
20	40- 80	343.1	276.1
	100-250	344.1	278.1
25	40- 40	345.1	279.1
	50- 50	346.1	280.1
	80-100	347.1	281.1
	150-250	348.1	282.1
40	50- 50	350.1	284.1
	80- 80	351.1	285.1
	100-100	352.1	286.1
	150-250	353.1	287.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.62.482.1		230	76.83.36.261.1
813	76.80.62.484.1		255	76.83.36.262.1
1219	76.80.62.486.1		305	76.83.36.263.1
1524	76.80.62.488.1		355	76.83.36.265.1
1829	76.80.62.490.1		405	76.83.36.266.1
2134	76.80.62.492.1		455	76.83.36.267.1
2438	76.80.62.494.1			
2743	76.80.62.496.1			
3048	76.80.62.498.1			

BOLTSET FLANGED JOINTS

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	* 120	63.332.1	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	1/8	* 180	63.533.1					
100	8	1/4	* 200	63.588.1					
150	12	1/8	* 260	63.649.1					
200	12	1/2	* 350	63.734.1					
250	12	1/2	* 400	63.798.1					

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	3/8	*	280	150	12	3/8	*	300
200	12	5/8	*	360	200	12	5/8	*	400
250	12	7/8	*	420	250	12	7/8	*	460

BOLTSET WAFER CHECK VALVE

DN	NR	INCH	* MM	81.38
50	8	7/8	* 220	63.417.1
80	8	1/8	* 270	63.525.1
100	8	1/4	* 300	63.610.1
150	12	3/8	* 430	63.671.1
200	12	5/8	* 560	63.751.1
250	12	7/8	* 640	63.809.1

ASSEMBLIES

```

* DRAIN POINT          DN 15  FIG.DF  DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE          1  76.66.01.152.1
GASKET, SPIRAL WOUND  2  85.43.58.204.1
MONOFL SINGLE BLOCK BALL  1  77.03.92.463.1
WELDING NECK FLANGE   1  76.66.29.686.1

```

```
* DRAIN POINT          DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COM.)
BLIND FLANGE          1  76.66.01.154.1
GASKET, SPIRAL WOUND  2  85.43.58.206.1
MONOFL SINGLE BLOCK BALL  1  77.03.92.464.1
WELDING NECK FLANGE   1  76.66.29.688.1
```

```

* DRAIN POINT          DN 20 FIG.DE   DN 50 -250
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE           1   76.66.01.154.1
GASKET, SPIRAL WOUND   2   85.43.58.206.1
MONOFL ANGLE BLOCK BALL 1   77.03.92.464.1

```

```

* ORIFICE INSTR.CONN.      DN 15  FIG.AB  DN 50 -250
Branch:  (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      2      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  2  77.85.47.863.1
WELDING NECK FLANGE       2  76.66.29.686.1

```

```
* PI ON PIPING CL COUP      DN 15  FIG.CB      DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 1      77.85.47.863.1
WELDING NECK FLANGE      1      76.66.29.686.1
```

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -250
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
```

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```

* METERRUN INSTR. CONN  DN 15  FIG.AA  DN 15 - 40
Branch:  (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND          2  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD 2  77.85.47.863.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AB   DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1      85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
WELDING NECK FLANGE       1  76.66.29.686.1

```

```

* PI ON PIPING REMOTE      DN 15  FIG.AA   DN 50 -250
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1

```

```

* 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      76.65.61.018.1
GASKET, SPIRAL WOUND                  1      85.43.58.212.1
STUD BOLT WITH NUTS                   4      81.38.63.472.1
THERMOWELL TAPERED                    1      76.83.36.261.1
                                L=230 MM

```

```

* TEMPERATURE INSTR.C.   DN 40   FIG.BB   DN150 -250
Branch:S (N=br.tab,S=BNIF,N=A) 1(PIPING COMP.)
COVER FLANGE THERMOWELL NOZZLE      1   76.65.61.018.1
GASKET, SPIRAL WOUND                 1   85.43.58.212.1
STUD BOLT WITH NUTS                  4   81.38.63.472.1
THERMOWELL TAPERED                   1   76.83.36.262.1
                                L=255 MM

```

```

* VENT POINT                DN 15  FIG.DF  DN 15 - 25
Branch:N (N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1  76.66.01.152.1
GASKET, SPIRAL WOUND        2  85.43.58.204.1
MONOFL SINGLE BLOCK NEEDLE 1  77.33.46.043.1
WELDING NECK FLANGE         1  76.66.29.686.1

```

```

* VENT POINT                DN 20  FIG.DF  DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,:=N/A) 1(PIPING COMP.)
BLIND FLANGE                1   76.66.01.154.1
GASKET, SPIRAL WOUND        2   85.43.58.206.1
MONOFL SINGLE BLOCK NEEDLE 1   77.33.46.044.1
WELDING NECK FLANGE        1   76.66.29.688.1

```

* VENT POINT	DN 20	FIG.DE	DN 50 -250
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.154.1	
GASKET, SPIRAL WOUND	2	85.43.58.206.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.044.1	

CLASS 153834

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 120

PRESSURE BAR GA
DN15 -250 222.3 222.3

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
- FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
- WHERE TWO OPTIONS ARE GIVEN FOR PIPE, THE MOST ECONOMIC CHOICE SHOULD BE CHECKED WITH THE SUPPLIER

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE									
	15	20	25	40	50	80	100	150	200	250
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	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	80S
20	80S
25	80S
40	80S
50	80S
80	80S
100	80S
150	120
200	100
250	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.

DUPLEX, UNS S31803, LT SOUR	PLANT :	
CLASS NO. : 153834	CONSIGNEE :	
ANS RATING : CLASS 1500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN250-250	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-250	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-250	ASTM A182-F51
COFL COVER FLANGE THERMOWELL NOZZLE	---	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-250	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-250	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-250	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15-250	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-250	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-250	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-250	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-250	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIF BRANCH FITTING FLANGED OUTLET	DN 15- 50	ASTM A182-F51
BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-250	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-250	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-250	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-250	ASTM A815-WP-S UNS S31803

* VALVES

BNFF BALL VALVE FB TRUNNION NON EXT	DN 50-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BNRF BALL VALVE RB TRUNNION NON EXT	DN 50-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTFB BALL VALVE FULL BORE TRUN FLGD	DN 50-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-250	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNf MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-250	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
LDPC LEVEL DISPLACER CHAMBER	DN100-100	ASTM A790 UNS S31803,A182-F51
MTRR METER RUN	DN 15- 40	ASTM A790 UNS S31803,A182-F51
ORFS ORIFICE FLANGE SET	DN 50-250	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A320-L7M/A194-7M
TWTG THERMOWELL TAPERED	DN 40- 40	ASTM A182-F51

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 153834, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE											
PIPE (WELDED)	74.36.57										173.1
PIPE	74.36.58	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
* FLANGES											
BLIND FLANGE	76.66.01	152.1	154.1	156.1	158.1	160.1	162.1	164.1	166.1	168.1	170.1
SPECTACLE BLIND FLANGE	76.88.24	160.1	162.1	163.1	164.1	165.1	166.1	168.1	170.1	172.1	174.1
SPADE BLIND	76.88.41	162.1	164.1	166.1	168.1	170.1	172.1	174.1	176.1	178.1	180.1
SPACER RING TYPE (ASME FLANGE)	76.88.23	412.1	414.1	416.1	418.1	420.1	422.1	424.1	426.1	428.1	430.1
WELDING NECK FLANGE	76.66.29	686.1	688.1	690.1	692.1	694.1	802.1	804.1	830.1	890.1	892.1
* FITTINGS											
CAP BUTT-WELD.END	76.36.05	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	038.1	048.1	058.1	078.1	088.1	108.1	128.1	148.1	159.1	173.1
* VALVES											
BALL VALVE FB TRUNNION NON EXT	77.03.86					708.1	710.1	712.1	714.1	715.1	716.1
BALL VALVE RB TRUNNION NON EXT	77.03.86					208.1	210.1	212.1	214.1	215.1	216.1
BALL VALVE FULL BORE TRUN FLGD	77.03.81					708.1	710.1	712.1	714.1	715.1	716.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					208.1	210.1	212.1	214.1	215.1	216.1
CHECK VALVE FLANGED	77.13.41	203.1	204.1	205.1	207.1						
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					208.1	210.1	212.1	214.1	215.1	216.1
GATE VALVE FLANGED	77.23.41	203.1	204.1	205.1	207.1						
GLOBE VALVE FLANGED	77.33.41	203.1	204.1	205.1	207.1	208.1	210.1	212.1			
MONOFL SINGLE BLOCK BALL	77.03.92	463.1	464.1	465.1	467.1	468.1					
* MISCELLANEOUS											
GASKET, SPIRAL WOUND	85.43.58	204.1	206.1	208.1	212.1	214.1	218.1	220.1	224.1	226.1	228.1
METER RUN	76.65.96	652.1	654.1	656.1	658.1						
ORIFICE FLANGE SET	76.66.90					660.1	694.1	696.1	754.1	793.1	794.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		36.43.004.1	36.58.004.1	36.83.004.1
25* 15		36.43.022.1	36.58.022.1	36.83.022.1
25* 20		36.43.038.1	36.58.038.1	36.83.038.1
40* 15		36.43.054.1	36.58.054.1	36.83.054.1
40* 20		36.43.072.1	36.58.072.1	36.83.072.1
40* 25		36.43.088.1	36.58.088.1	36.83.088.1
50* 20		36.43.104.1	36.58.104.1	36.83.104.1
50* 25		36.43.122.1	36.58.122.1	36.83.122.1
50* 40		36.43.138.1	36.58.138.1	36.83.138.1
80* 40		36.43.154.1	36.58.154.1	36.83.154.1
80* 50		36.43.172.1	36.58.172.1	36.83.172.1
100* 40		36.43.188.1	36.58.188.1	36.83.188.1
100* 50		36.43.207.1	36.58.207.1	36.83.207.1
100* 80		36.43.226.1	36.58.226.1	36.83.226.1
150* 50	78.50.488.1			
150* 80		36.43.253.1	36.58.253.1	36.83.253.1
150*100		36.43.271.1	36.58.271.1	36.83.271.1
200* 50	78.51.001.1			
200* 80	78.51.010.1			
200*100		36.43.291.1	36.58.291.1	36.83.294.1
200*150		36.43.321.1	36.58.321.1	36.83.318.1
250* 50	78.51.002.1			
250* 80	78.51.011.1			
250*100	78.51.020.1			
250*150		36.43.364.1	36.58.364.1	36.83.365.1
250*200		36.43.381.1	36.58.381.1	36.83.381.1

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
		76.80.35	76.80.34
BRANCH	RUN-PIPE		
-----	-----	-----	-----
15	40-150	341.1	272.1
	200-250	342.1	274.1
20	40- 80	343.1	276.1
	100-250	344.1	278.1
25	40- 40	345.1	279.1
	50- 50	346.1	280.1
	80-100	347.1	281.1
	150-250	348.1	282.1
40	50- 50	350.1	284.1
	80- 80	351.1	285.1
	100-100	352.1	286.1
	150-250	353.1	287.1

LEVEL	DISPLACER	CHAMBER		THERMOWELL
LENGTH	MESCNUMBER			LENGTH MESCNUMBER
-----	-----			-----
356	76.80.62.482.1		230	76.83.36.261.1
813	76.80.62.484.1		255	76.83.36.262.1
1219	76.80.62.486.1		305	76.83.36.263.1
1524	76.80.62.488.1		355	76.83.36.265.1
1829	76.80.62.490.1		405	76.83.36.266.1
2134	76.80.62.492.1		455	76.83.36.267.1
2438	76.80.62.494.1			
2743	76.80.62.496.1			
3048	76.80.62.498.1			

BOLTSET METER-RUN

BOLTSET SPECTACLE/SPACERBOLTSET WAFFER CHECK VALVE

ASSEMBLIES

```
* PI ON PIPING CL COUP    DN 15  FIG.CA    DN 50 -250
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND      1  85.43.58.204.1
VALVE ASS DOUB BLOCK BALL THRD  1  77.85.47.863.1
```

* VENT POINT	DN 20	FIG.DE	DN 50 -250
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	76.66	01.154.1
BLIND FLANGE	1	76.66	01.154.1
GASKET, SPIRAL WOUND	2	85.43	58.206.1
MONOF. SINGLE BLOCK NEEDLE	1	77.33	46.044.1

PIPING CLASSES ASME RATING 2500

CLASS 251410

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS				
	0	50	75	100	120

	PRESSURE BAR GA				
DN15 -300	425.4	417.1	400.2	386.5	382.7

- 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.
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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
250	C	C	C	C	E	E	E	B
200	C	C	C	C	E	E	B	B
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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	20.0
150	28.0
200	36.0
250	44.0
300	52.0

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.

CARBON STEEL	PLANT	:	
CLASS NO. : 251410	CONSIGNEE	:	
ANS RATING : CLASS 2500	ENGINEERED BY :		
CORR. ALL. : 1 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO. :		
REV. DATE : 07/97	PROJECT NO. :		

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-100	ASTM A106-B
		DN150-300	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	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 15-100	ASTM A234-WPB
		DN150-300	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A234-WPB
		DN150-300	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A234-WPB
		DN150-300	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-100	ASTM A234-WPB
		DN150-300	ASTM A420-WPL6

* 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 80-100	ASTM A105
		DN150-300	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A234-WPB
		DN150-300	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A234-WPB
		DN150-300	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-100	ASTM A234-WPB
		DN150-300	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316 (L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
ORFS	ORIFICE FLANGE SET	DN 50- 80	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 251410, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE												
PIPE	74.30.00							092.1				
	74.30.05	022.1	032.1	042.1	062.1	075.1	115.1					
	74.30.14								114.1	152.1	194.1	248.1
* 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					
	76.62.85							092.1	114.1	152.1	194.1	248.1
* FITTINGS												
CAP BUTT-WELD.END	76.30.19	023.1	029.1	033.1	043.1	063.1	083.1					
	76.30.22							092.1				
	76.31.15								114.1	152.1	194.1	248.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.38	573.1	579.1	583.1	593.1	613.1	633.1					
	76.30.44							092.1				
	76.31.44								102.1	146.1	187.1	239.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.40	573.1	579.1	583.1	593.1	613.1	633.1					
	76.30.46							092.1				
	76.31.46								114.1		194.1	248.1
EQUAL TEE BUTT-WELD ENDS	76.30.84	573.1	579.1	583.1	593.1	613.1	633.1					
	76.30.90							092.1				
	76.31.90								114.1	152.1	194.1	248.1
* VALVES												
BALL VALVE FULL BORE TRUN FLGD	77.00.72					758.1	760.1	762.1	764.1	765.1	766.1	767.1
BALL VALVE RED. BORE TRUN FLGD	77.00.72					258.1	260.1	262.1	264.1	265.1	266.1	267.1
CHECK VALVE FLANGED	77.10.23					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							
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					258.1	260.1	262.1	264.1	265.1	266.1	267.1
GLOBE VALVE FLANGED	77.30.23					258.1	260.1	262.1				
	77.30.73	253.1	254.1	255.1	257.1							
MONOFL SINGLE BLOCK BALL	77.00.95	483.1	484.1	485.1	487.1	488.1						
* 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					160.1	164.1					

	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	30.89.103.1
50* 25		30.72.202.1	30.73.202.1	30.89.108.1
50* 40		30.72.212.1	30.73.212.1	30.89.117.1
80* 40		30.72.232.1	30.73.232.1	30.89.126.1
80* 50	79.03.680.1	30.72.242.1	30.73.242.1	30.89.135.1
100* 40		30.62.060.1	30.63.060.1	30.93.056.1
100* 50	79.08.015.1	30.62.070.1	30.63.070.1	30.93.070.1
100* 80		30.62.090.1	30.63.090.1	30.93.090.1
150* 50	79.09.040.1			
150* 80		31.62.114.1	31.63.114.1	31.93.090.1
150*100		31.62.142.1	31.63.142.1	31.93.115.1
200* 50	79.09.066.1			
200* 80	79.09.306.1			
200*100		31.62.178.1	31.63.178.1	31.93.179.1
200*150		31.62.212.1	31.63.212.1	31.93.213.1
250* 50	79.09.097.1			
250* 80	79.09.357.1			
250*100	79.09.640.1	31.62.261.1	31.63.267.1	
250*150		31.62.298.1	31.63.298.1	31.93.298.1
250*200		31.62.348.1	31.63.348.1	31.93.348.1
300* 50	79.09.149.1			
300* 80	79.09.409.1			
300*100	79.09.680.1			
300*150		31.62.407.1	31.63.407.1	31.93.402.1
300*200		31.62.465.1	31.63.465.1	31.93.465.1
300*250		31.62.529.1	31.63.529.1	31.93.529.1

		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

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 ORIFICE FLANGES

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

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		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	50	8	1	* 250	61.486.1
80	8	1 1/4	* 260	61.603.1	80	8	1 1/4	* 320	61.612.1
100	8	1 1/2	* 350	61.704.1	100	8	1 1/2	* 420	61.711.1
150	8	2	* 460	61.834.1	150	8	2	* 560	83.567.1
200	12	2	* 510	83.562.1	200	12	2	* 650	83.576.1
250	12	2 1/2	* 640	83.715.1	250	12	2 1/2	* 830	83.733.1
300	12	2 3/4	* 720	83.793.1					

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.483.1
WELDING NECK FLANGE 1 76.62.80.052.1

* DRAIN POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1
WELDING NECK FLANGE 1 76.62.80.054.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1
WELDING NECK FLANGE 2 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* VENT POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.063.1
WELDING NECK FLANGE 1 76.62.80.052.1

* VENT POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1
WELDING NECK FLANGE 1 76.62.80.054.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1

CLASS 251420

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

PRESSURE BAR GA
DN15 -300 308.8 308.8

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 1.1, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
COLD BENDING IS NOT ALLOWED.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - BALL VALVES WITH BALL OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS BALL (IN SAME MESC DESCRIPTION) FOR 80+ DEG C.
 - 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
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE									
	15	20	25	40	50	80	100	150	200	250
300	C	C	C	C	E	E	E	B	B	B
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	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	160
20	160
25	160
40	160
50	160
80	XXS
100	XXS
150	XXS
200	26.0
250	32.0
300	38.0

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 SOUR	PLANT :	
CLASS NO. : 251420	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 1 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 251420, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-150	ASTM A106-B
		DN200-300	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	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 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* 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	DN100-150	ASTM A105
		DN200-250	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316 (L) +ENP,NYLON
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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316 (L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 251420, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE												
PIPE	74.30.03	020.1	030.1	040.1	060.1	073.1	115.1	163.1	229.1			
	74.30.15									142.1	182.1	234.1
* 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	002.1	004.1	006.1	008.1	010.1	064.1	066.1	068.1			
	76.62.85									142.1	182.1	234.1
* FITTINGS												
CAP BUTT-WELD.END	76.30.17	572.1	578.1	582.1	592.1	612.1	633.1	653.1	673.1			
	76.31.16									142.1	182.1	234.1
ELBOW 45 DEG BUTT-WELD ENDS	76.30.34	572.1	578.1	582.1	592.1	612.1	633.1	653.1	673.1			
	76.31.45									142.1	182.1	234.1
ELBOW 90 DEG BUTT-WELD ENDS	76.30.42	572.1	578.1	582.1	592.1	612.1	633.1	653.1	673.1			
	76.31.47									142.1	182.1	234.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	572.1	578.1	582.1	592.1	612.1	633.1	653.1	673.1			
	76.31.91									142.1	182.1	234.1
* VALVES												
BALL VALVE FULL BORE TRUN FLGD	77.00.72					758.1	760.1	762.1	764.1	765.1	766.1	767.1
BALL VALVE RED. BORE TRUN FLGD	77.00.72					258.1	260.1	262.1	264.1	265.1	266.1	267.1
CHECK VALVE FLANGED	77.10.23					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							
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					258.1	260.1	262.1	264.1	265.1	266.1	267.1
GLOBE VALVE FLANGED	77.30.23					258.1	260.1	262.1				
	77.30.73	253.1	254.1	255.1	257.1							
MONOFL SINGLE BLOCK BALL	77.00.95	483.1	484.1	485.1	487.1	488.1						
* 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	164.1	166.1	168.1			

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		30.66.141.1	30.67.141.1	30.88.039.1
25* 15		30.66.151.1	30.67.151.1	30.88.049.1
25* 20		30.66.161.1	30.67.161.1	30.88.059.1
40* 15		30.66.171.1	30.67.171.1	30.88.069.1
40* 20		30.66.181.1	30.67.181.1	30.88.079.1
40* 25		30.66.191.1	30.67.191.1	30.88.089.1
50* 20		30.66.195.1	30.67.195.1	30.88.098.1
50* 25		30.66.201.1	30.67.201.1	30.88.107.1
50* 40		30.66.211.1	30.67.211.1	30.88.116.1
80* 40		30.66.234.1	30.67.234.1	30.88.131.1
80* 50		30.66.243.1	30.67.243.1	30.88.141.1
100* 40		30.66.258.1	30.67.258.1	30.88.152.1
100* 50		30.66.273.1	30.67.273.1	30.88.164.1
100* 80	79.03.694.1	30.66.282.1	30.67.282.1	30.88.168.1
150* 50	79.03.362.1			
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* 80	79.09.301.1			
200*100		31.64.163.1	31.65.163.1	31.94.163.1
200*150		31.64.197.1	31.65.197.1	31.94.198.1
250* 80	79.09.351.1			
250*100	79.09.649.1	31.64.246.1	31.65.248.1	31.94.233.1
250*150		31.64.279.1	31.65.279.1	31.94.279.1
250*200		31.64.329.1	31.65.329.1	31.94.329.1
300*150		31.64.381.1	31.65.381.1	31.94.381.1

		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	

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

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 130	66.334.1					
20	4	3/4	* 130	66.334.1					
25	4	7/8	* 140	66.404.1					
40	4	1 1/8	* 170	66.532.1					
50	8	1	* 180	66.475.1	50	8	1	* 190	66.477.1
80	8	1 1/4	* 220	66.597.1	80	8	1 1/4	* 230	66.598.1
100	8	1 1/2	* 300	66.696.1	100	8	1 1/2	* 320	66.700.1
150	8	2	* 410	66.825.1	150	8	2	* 420	66.827.1
200	12	2	* 450	66.831.1	200	12	2	* 460	66.834.1
250	12	2 1/2	* 570	86.708.1	250	12	2 1/2	* 570	86.708.1
300	12	2 3/4	* 630	86.784.1	300	12	2 3/4	* 640	86.785.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 140	66.335.1					
20	4	3/4	* 140	66.335.1					
25	4	7/8	* 160	66.407.1					
40	4	1 1/8	* 190	66.535.1					
50	8	1	* 210	66.480.1	50	8	1	* 250	66.486.1
80	8	1 1/4	* 260	66.603.1	80	8	1 1/4	* 320	66.612.1
100	8	1 1/2	* 350	66.704.1	100	8	1 1/2	* 420	66.711.1
150	8	2	* 460	66.834.1	150	8	2	* 560	86.567.1
200	12	2	* 510	86.562.1	200	12	2	* 650	86.576.1
250	12	2 1/2	* 640	86.715.1	250	12	2 1/2	* 830	86.733.1
300	12	2 3/4	* 720	86.793.1					

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.483.1
WELDING NECK FLANGE 1 76.62.80.002.1

* DRAIN POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1
WELDING NECK FLANGE 1 76.62.80.004.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1
WELDING NECK FLANGE 2 76.62.80.002.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.002.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.002.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* VENT POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.063.1
WELDING NECK FLANGE 1 76.62.80.002.1

* VENT POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1
WELDING NECK FLANGE 1 76.62.80.004.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1

CLASS 251430

DESIGN LIMITS

	TEMPERATURE IN DEGREES CELSIUS				
	0	50	75	100	120

	PRESSURE BAR GA				
DN15 -300	425.4	417.1	400.2	386.5	382.7

- 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.
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
- A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	XXS
20	XXS
25	XXS
40	12.0
50	13.0
80	18.0
100	22.0
150	30.0
200	38.0
250	48.0
300	56.0

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.

CARBON STEEL	PLANT	:	
CLASS NO. : 251430	CONSIGNEE	:	
ANS RATING : CLASS 2500	ENGINEERED BY	:	
CORR. ALL. : 3 mm.	PRINCIPAL	:	
REV. LETTER : A	CONTR.JOB NO.	:	
REV. DATE : 07/97	PROJECT NO.	:	

ISSUE DATE : DECEMBER 1998

* PIPE

BTRF	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A216-WCB/WCC,A105

DN 50-300 BODY: ASTM A216-WCB/WCC, A105
TRIM: AISI 410

CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A216-WCB/WCC, A105 TRIM: AISI 316, STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC, A105 TRIM: AISI 410

MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* 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

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	DN150-300	ASTM A350-LF2
RECB	REDUCER CONC	BUTT WELD ENDS	DN 20-100	ASTM A234-WPB
			DN150-300	ASTM A420-WPL6
REEB	REDUCER ECC	BUTT WELD ENDS	DN 20-100	ASTM A234-WPB
			DN150-300	ASTM A420-WPL6
TERB	TEE REDUCING	BUTT WELD ENDS	DN 20-100	ASTM A234-WPB
			DN150-300	ASTM A420-WPL6

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 251430, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE													
PIPE		74.30.00				032.1	052.1	072.1	094.1				
		74.30.05	022.1	032.1	042.1								
		74.30.14								116.1	154.1	198.1	252.1
* 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								
		76.62.85				032.1	052.1	072.1	094.1	116.1	154.1	198.1	252.1
* FITTINGS													
CAP BUTT-WELD.END		76.30.19	023.1	029.1	033.1	040.1							
		76.30.22					052.1	072.1	094.1				
		76.31.15								116.1	154.1	198.1	252.1
ELBOW 45 DEG BUTT-WELD ENDS		76.30.38	573.1	579.1	583.1								
		76.30.44				032.1	052.1	072.1	094.1				
		76.31.44								103.1	147.1	189.1	241.1
ELBOW 90 DEG BUTT-WELD ENDS		76.30.40	573.1	579.1	583.1								
		76.30.46				032.1	052.1	072.1	094.1				
		76.31.46								116.1	154.1	198.1	252.1
EQUAL TEE BUTT-WELD ENDS		76.30.84	573.1	579.1	583.1								
		76.30.90				032.1	052.1	072.1	094.1				
		76.31.90								116.1	154.1	198.1	252.1
* VALVES													
BALL VALVE FULL BORE TRUN FLGD		77.00.73					758.1	760.1	762.1	764.1	765.1	766.1	767.1
BALL VALVE RED. BORE TRUN FLGD		77.00.73					258.1	260.1	262.1	264.1	265.1	266.1	267.1
CHECK VALVE FLANGED		77.10.23					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							
DUAL PL. CHECK VALVE WAFER LUG		77.67.51					258.1	260.1	262.1	264.1	265.1	266.1	267.1
GLOBE VALVE FLANGED		77.30.23					258.1	260.1	262.1				
		77.30.73	253.1	254.1	255.1	257.1							
MONOFL SINGLE BLOCK BALL		77.00.95	483.1	484.1	485.1	487.1	488.1						
* 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		30.62.014.1	30.63.014.1	30.89.071.1
40* 20		30.62.019.1	30.63.019.1	30.93.021.1
40* 25		30.62.024.1	30.63.024.1	30.93.026.1
50* 20		30.62.026.1	30.63.026.1	30.93.031.1
50* 25		30.62.028.1	30.63.028.1	30.93.036.1
50* 40		30.62.036.1	30.63.036.1	30.93.041.1
80* 40		30.62.041.1	30.63.041.1	30.93.046.1
80* 50		30.62.052.1	30.63.052.1	30.93.052.1
100* 40		30.62.062.1	30.63.062.1	30.93.058.1
100* 50		30.62.075.1	30.63.075.1	30.93.075.1
100* 80		30.62.095.1	30.63.095.1	30.93.095.1
150* 50	79.09.050.1			
150* 80		31.62.118.1	31.63.118.1	31.93.093.1
150*100		31.62.145.1	31.63.145.1	31.93.118.1
200* 50	79.09.080.1			
200* 80	79.09.335.1			
200*100		31.62.182.1	31.63.182.1	31.93.181.1
200*150		31.62.216.1	31.63.216.1	31.93.216.1
250* 50	79.09.125.1			
250* 80	79.09.385.1			
250*100		31.62.268.1	31.63.272.1	31.93.257.1
250*150		31.62.304.1	31.63.304.1	31.93.304.1
250*200		31.62.353.1	31.63.353.1	31.93.354.1
300* 50	79.09.175.1			
300* 80	79.09.435.1			
300*100	79.09.684.1			
300*150		31.62.412.1	31.63.412.1	31.93.408.1
300*200		31.62.471.1	31.63.471.1	31.93.471.1
300*250		31.62.535.1	31.63.535.1	31.93.535.1

		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	096.1	
	150-300	098.1	

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 ORIFICE FLANGES

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

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		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	50	8	1	* 250	61.486.1
80	8	1 1/4	* 260	61.603.1	80	8	1 1/4	* 320	61.612.1
100	8	1 1/2	* 350	61.704.1	100	8	1 1/2	* 420	61.711.1
150	8	2	* 460	61.834.1	150	8	2	* 560	83.567.1
200	12	2	* 510	83.562.1	200	12	2	* 650	83.576.1
250	12	2 1/2	* 640	83.715.1	250	12	2 1/2	* 830	83.733.1
300	12	2 3/4	* 720	83.793.1					

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.483.1
WELDING NECK FLANGE 1 76.62.80.052.1

* DRAIN POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1
WELDING NECK FLANGE 1 76.62.80.054.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1
WELDING NECK FLANGE 2 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* VENT POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.063.1
WELDING NECK FLANGE 1 76.62.80.052.1

* VENT POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1
WELDING NECK FLANGE 1 76.62.80.054.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1

CLASS 251440

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

	PRESSURE BAR GA		
DN15 -100	308.8	308.8	
DN150-300	278.4	278.4	

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
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	28.0
250	34.0
300	40.0

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.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 251440	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-150	ASTM A106-B
		DN200-300	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	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 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* 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 80-150	ASTM A105
		DN250-300	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE												
PIPE	74.30.03	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1			
	74.30.15									144.1	184.1	236.1
* 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									144.1	184.1	236.1
* FITTINGS												
CAP BUTT-WELD.END	76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1			
	76.31.16									144.1	184.1	236.1
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			
	76.31.45									144.1	184.1	236.1
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			
	76.31.47									144.1	184.1	236.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1			
	76.31.91									144.1	184.1	236.1
* VALVES												
BALL VALVE FULL BORE TRUN FLGD	77.00.73					758.1	760.1	762.1	764.1	765.1	766.1	767.1
BALL VALVE RED. BORE TRUN FLGD	77.00.73					258.1	260.1	262.1	264.1	265.1	266.1	267.1
CHECK VALVE FLANGED	77.10.23					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							
DUAL PL. CHECK VALVE WAFER LUG	77.67.51					258.1	260.1	262.1	264.1	265.1	266.1	267.1
GLOBE VALVE FLANGED	77.30.23					258.1	260.1	262.1				
	77.30.73	253.1	254.1	255.1	257.1							
MONOFL SINGLE BLOCK BALL	77.00.95	483.1	484.1	485.1	487.1	488.1						
* 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					160.1	164.1	166.1	168.1			

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		30.66.142.1	30.67.142.1	30.88.040.1
25* 15		30.66.152.1	30.67.152.1	30.88.050.1
25* 20		30.66.162.1	30.67.162.1	30.88.060.1
40* 15		30.66.172.1	30.67.172.1	30.88.070.1
40* 20		30.66.182.1	30.67.182.1	30.88.080.1
40* 25		30.66.192.1	30.67.192.1	30.88.090.1
50* 20		30.66.195.1	30.67.195.1	30.88.099.1
50* 25		30.66.202.1	30.67.202.1	30.88.108.1
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	30.88.144.1
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*100		31.64.166.1	31.65.166.1	31.94.166.1
200*150		31.64.200.1	31.65.200.1	31.94.201.1
250* 50	79.09.092.1			
250* 80	79.09.352.1			
250*100		31.64.249.1	31.65.251.1	31.94.236.1
250*150		31.64.281.1	31.65.282.1	31.94.281.1
250*200		31.64.332.1	31.65.332.1	31.94.332.1
300* 50	79.09.143.1			
300* 80	79.09.403.1			
300*100	79.09.653.1			
300*150		31.64.384.1	31.65.384.1	31.94.384.1
300*200		31.64.447.1	31.65.447.1	31.94.446.1
300*250		31.64.510.1	31.65.510.1	31.94.509.1

		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

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 ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 130	66.334.1					
20	4	3/4	* 130	66.334.1					
25	4	7/8	* 140	66.404.1					
40	4	1 1/8	* 170	66.532.1					
50	8	1	* 180	66.475.1	50	8	1	* 190	66.477.1
80	8	1 1/4	* 220	66.597.1	80	8	1 1/4	* 230	66.598.1
100	8	1 1/2	* 300	66.696.1	100	8	1 1/2	* 320	66.700.1
150	8	2	* 410	66.825.1	150	8	2	* 420	66.827.1
200	12	2	* 450	66.831.1	200	12	2	* 460	66.834.1
250	12	2 1/2	* 570	86.708.1	250	12	2 1/2	* 570	86.708.1
300	12	2 3/4	* 630	86.784.1	300	12	2 3/4	* 640	86.785.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 140	66.335.1					
20	4	3/4	* 140	66.335.1					
25	4	7/8	* 160	66.407.1					
40	4	1 1/8	* 190	66.535.1					
50	8	1	* 210	66.480.1	50	8	1	* 250	66.486.1
80	8	1 1/4	* 260	66.603.1	80	8	1 1/4	* 320	66.612.1
100	8	1 1/2	* 350	66.704.1	100	8	1 1/2	* 420	66.711.1
150	8	2	* 460	66.834.1	150	8	2	* 560	86.567.1
200	12	2	* 510	86.562.1	200	12	2	* 650	86.576.1
250	12	2 1/2	* 640	86.715.1	250	12	2 1/2	* 830	86.733.1
300	12	2 3/4	* 720	86.793.1					

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.483.1
WELDING NECK FLANGE 1 76.62.80.052.1

* DRAIN POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1
WELDING NECK FLANGE 1 76.62.80.054.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1
WELDING NECK FLANGE 2 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* VENT POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.063.1
WELDING NECK FLANGE 1 76.62.80.052.1

* VENT POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1
WELDING NECK FLANGE 1 76.62.80.054.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1

CLASS 251441

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

	PRESSURE BAR GA	
DN15 -100	308.8	308.8
DN150-300	278.4	278.4

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
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	28.0
250	34.0
300	40.0

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.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 251441	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-150	ASTM A106-B
		DN200-300	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	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 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* 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 80-150	ASTM A105
		DN250-300	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE													
PIPE	74.30.03	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1				
	74.30.15										144.1	184.1	236.1
* 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										144.1	184.1	236.1
* FITTINGS													
CAP BUTT-WELD.END	76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1				
	76.31.16										144.1	184.1	236.1
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				
	76.31.45										144.1	184.1	236.1
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				
	76.31.47										144.1	184.1	236.1
EQUAL TEE BUTT-WELD ENDS	76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1				
	76.31.91										144.1	184.1	236.1
* VALVES													
BALL VALVE FULL BORE TRUN FLGD	77.00.91					758.1	760.1	762.1	764.1	765.1	766.1	767.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.91					258.1	260.1	262.1	264.1	265.1	266.1	267.1	
CHECK VALVE FLANGED	77.10.43					258.1	260.1	262.1	264.1	265.1	266.1	267.1	
	77.10.78	253.1	254.1	255.1	257.1								
DUAL PL. CHECK VALVE WAFER LUG	77.67.57					258.1	260.1	262.1	264.1	265.1	266.1	267.1	
GLOBE VALVE FLANGED	77.30.53	253.1	254.1	255.1	257.1	258.1	260.1	262.1					
MONOFL SINGLE BLOCK BALL	77.00.97	483.1	484.1	485.1	487.1	488.1							
* 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					160.1	164.1	166.1	168.1				

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		30.66.142.1	30.67.142.1	30.88.040.1
25* 15		30.66.152.1	30.67.152.1	30.88.050.1
25* 20		30.66.162.1	30.67.162.1	30.88.060.1
40* 15		30.66.172.1	30.67.172.1	30.88.070.1
40* 20		30.66.182.1	30.67.182.1	30.88.080.1
40* 25		30.66.192.1	30.67.192.1	30.88.090.1
50* 20		30.66.195.1	30.67.195.1	30.88.099.1
50* 25		30.66.202.1	30.67.202.1	30.88.108.1
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	30.88.144.1
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*100		31.64.166.1	31.65.166.1	31.94.166.1
200*150		31.64.200.1	31.65.200.1	31.94.201.1
250* 50	79.09.092.1			
250* 80	79.09.352.1			
250*100		31.64.249.1	31.65.251.1	31.94.236.1
250*150		31.64.281.1	31.65.282.1	31.94.281.1
250*200		31.64.332.1	31.65.332.1	31.94.332.1
300* 50	79.09.143.1			
300* 80	79.09.403.1			
300*100	79.09.653.1			
300*150		31.64.384.1	31.65.384.1	31.94.384.1
300*200		31.64.447.1	31.65.447.1	31.94.446.1
300*250		31.64.510.1	31.65.510.1	31.94.509.1

		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

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 ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 130	66.334.1					
20	4	3/4	* 130	66.334.1					
25	4	7/8	* 140	66.404.1					
40	4	1 1/8	* 170	66.532.1					
50	8	1	* 180	66.475.1	50	8	1	* 190	66.477.1
80	8	1 1/4	* 220	66.597.1	80	8	1 1/4	* 230	66.598.1
100	8	1 1/2	* 300	66.696.1	100	8	1 1/2	* 320	66.700.1
150	8	2	* 410	66.825.1	150	8	2	* 420	66.827.1
200	12	2	* 450	66.831.1	200	12	2	* 460	66.834.1
250	12	2 1/2	* 570	86.708.1	250	12	2 1/2	* 570	86.708.1
300	12	2 3/4	* 630	86.784.1	300	12	2 3/4	* 640	86.785.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 140	66.335.1					
20	4	3/4	* 140	66.335.1					
25	4	7/8	* 160	66.407.1					
40	4	1 1/8	* 190	66.535.1					
50	8	1	* 210	66.480.1	50	8	1	* 250	66.486.1
80	8	1 1/4	* 260	66.603.1	80	8	1 1/4	* 320	66.612.1
100	8	1 1/2	* 350	66.704.1	100	8	1 1/2	* 420	66.711.1
150	8	2	* 460	66.834.1	150	8	2	* 560	86.567.1
200	12	2	* 510	86.562.1	200	12	2	* 650	86.576.1
250	12	2 1/2	* 640	86.715.1	250	12	2 1/2	* 830	86.733.1
300	12	2 3/4	* 720	86.793.1					

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK BALL 1 77.00.97.483.1
WELDING NECK FLANGE 1 76.62.80.052.1

* DRAIN POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.97.484.1
WELDING NECK FLANGE 1 76.62.80.054.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.97.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.383.1
WELDING NECK FLANGE 2 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.383.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.383.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.383.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.383.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.383.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* VENT POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.063.1
WELDING NECK FLANGE 1 76.62.80.052.1

* VENT POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.064.1
WELDING NECK FLANGE 1 76.62.80.054.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.064.1

CLASS 251520

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

	PRESSURE BAR GA		
DN15 -100	308.8	308.8	
DN150-300	278.4	278.4	

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
- BALL VALVES WITH BODY OF CS + ENP ARE LIMITED TO 80 DEG. C MAX. USE OPTION OF SS OVERLAY IN SEAL AREA'S (IN SAME MESC DESCRIPTION) FOR 80+ DEG. C.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	28.0
250	34.0
300	40.0

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.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 251520	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-150	ASTM A106-B
		DN200-300	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	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 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* 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 80-150	ASTM A105
		DN250-300	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A216+ENP,A105+ENP TRIM: BODY MAT,AISI 316,NYLON
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
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 316,STELLITE 6
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: AISI 410
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: AISI 316,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: AISI 316

* MISCELLANEOUS

CLBL	BLIND HUB FOR CLAMP COUPLING	DN 15-150	AISI 4140 WITH PTFE COATING
CLHB	HUB FOR CLAMP COUPLING BW END	DN 15-150	ASTM A350-LF2
CLSR	SEAL RING FOR CLAMP COUPLING	DN 15-150	AISI 4140 WITH PTFE COATING
GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 251520, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE														
PIPE		74.30.03	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1				
		74.30.15									144.1	184.1	236.1	
* 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									144.1	184.1	236.1	
* FITTINGS														
CAP BUTT-WELD.END		76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1				
		76.31.16									144.1	184.1	236.1	
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				
		76.31.45									144.1	184.1	236.1	
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				
		76.31.47									144.1	184.1	236.1	
EQUAL TEE BUTT-WELD ENDS		76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1				
		76.31.91									144.1	184.1	236.1	
* VALVES														
BALL VALVE FULL BORE TRUN FLGD		77.00.73					758.1	760.1	762.1	764.1	765.1	766.1	767.1	
BALL VALVE RED. BORE TRUN FLGD		77.00.73					258.1	260.1	262.1	264.1	265.1	266.1	267.1	
CHECK VALVE FLANGED		77.10.23					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								
DUAL PL. CHECK VALVE WAFER LUG		77.67.51					258.1	260.1	262.1	264.1	265.1	266.1	267.1	
GLOBE VALVE FLANGED		77.30.23					258.1	260.1	262.1					
		77.30.73	253.1	254.1	255.1	257.1								
MONOFL SINGLE BLOCK BALL		77.00.95	483.1	484.1	485.1	487.1	488.1							
* MISCELLANEOUS														
BLIND HUB FOR CLAMP COUPLING		76.81.09	028.1	028.1	026.1	034.1	048.1	086.1	110.1	148.1				
CLAMP FOR CLAMP COUPLING		76.81.01			006.1	008.1	010.1	012.1	014.1	018.1				
HUB FOR CLAMP COUPLING BW END		76.81.13	008.1	016.1	026.1	036.1	048.1	088.1	110.1	150.1				
SEAL RING FOR CLAMP COUPLING		76.81.05	006.1	006.1	012.1	030.1	030.1	060.1	078.1	126.1				
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					160.1	164.1	166.1	168.1				

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		30.66.142.1	30.67.142.1	30.88.040.1
25* 15		30.66.152.1	30.67.152.1	30.88.050.1
25* 20		30.66.162.1	30.67.162.1	30.88.060.1
40* 15		30.66.172.1	30.67.172.1	30.88.070.1
40* 20		30.66.182.1	30.67.182.1	30.88.080.1
40* 25		30.66.192.1	30.67.192.1	30.88.090.1
50* 20		30.66.195.1	30.67.195.1	30.88.099.1
50* 25		30.66.202.1	30.67.202.1	30.88.108.1
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	30.88.144.1
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*100		31.64.166.1	31.65.166.1	31.94.166.1
200*150		31.64.200.1	31.65.200.1	31.94.201.1
250* 50	79.09.092.1			
250* 80	79.09.352.1			
250*100		31.64.249.1	31.65.251.1	31.94.236.1
250*150		31.64.281.1	31.65.282.1	31.94.281.1
250*200		31.64.332.1	31.65.332.1	31.94.332.1
300* 50	79.09.143.1			
300* 80	79.09.403.1			
300*100	79.09.653.1			
300*150		31.64.384.1	31.65.384.1	31.94.384.1
300*200		31.64.447.1	31.65.447.1	31.94.446.1
300*250		31.64.510.1	31.65.510.1	31.94.509.1

		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

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 ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 130	66.334.1					
20	4	3/4	* 130	66.334.1					
25	4	7/8	* 140	66.404.1					
40	4	1 1/8	* 170	66.532.1					
50	8	1	* 180	66.475.1	50	8	1	* 190	66.477.1
80	8	1 1/4	* 220	66.597.1	80	8	1 1/4	* 230	66.598.1
100	8	1 1/2	* 300	66.696.1	100	8	1 1/2	* 320	66.700.1
150	8	2	* 410	66.825.1	150	8	2	* 420	66.827.1
200	12	2	* 450	66.831.1	200	12	2	* 460	66.834.1
250	12	2 1/2	* 570	86.708.1	250	12	2 1/2	* 570	86.708.1
300	12	2 3/4	* 630	86.784.1	300	12	2 3/4	* 640	86.785.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 140	66.335.1					
20	4	3/4	* 140	66.335.1					
25	4	7/8	* 160	66.407.1					
40	4	1 1/8	* 190	66.535.1					
50	8	1	* 210	66.480.1	50	8	1	* 250	66.486.1
80	8	1 1/4	* 260	66.603.1	80	8	1 1/4	* 320	66.612.1
100	8	1 1/2	* 350	66.704.1	100	8	1 1/2	* 420	66.711.1
150	8	2	* 460	66.834.1	150	8	2	* 560	86.567.1
200	12	2	* 510	86.562.1	200	12	2	* 650	86.576.1
250	12	2 1/2	* 640	86.715.1	250	12	2 1/2	* 830	86.733.1
300	12	2 3/4	* 720	86.793.1					

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.483.1
WELDING NECK FLANGE 1 76.62.80.052.1

* DRAIN POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1
WELDING NECK FLANGE 1 76.62.80.054.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.95.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1
WELDING NECK FLANGE 2 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.083.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.083.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* VENT POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.063.1
WELDING NECK FLANGE 1 76.62.80.052.1

* VENT POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1
WELDING NECK FLANGE 1 76.62.80.054.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.91.064.1

CLASS 251521

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
0 120

	PRESSURE BAR GA	
DN15 -100	308.8	308.8
DN150-300	278.4	278.4

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
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN. COLD BENDING IS NOT ALLOWED.
- THE USE OF DUAL PLATE CHECK VALVES IS PREFERRED, ONLY USE SWING TYPE CHECK VALVES WHEN REQUIRED
- 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
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	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	XXS
20	XXS
25	XXS
40	XXS
50	XXS
80	XXS
100	XXS
150	XXS
200	28.0
250	34.0
300	40.0

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.

CARBON STEEL SOUR	PLANT :	
CLASS NO. : 251521	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 3 mm.	PRINCIPAL :	
REV. LETTER : O	CONTR.JOB NO. :	
REV. DATE : 07/97	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 251521, REV.O PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-150	ASTM A106-B
		DN200-300	ASTM A333-6

* FLANGES

BLFL	BLIND FLANGE	DN 15-300	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 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* 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 80-150	ASTM A105
		DN250-300	ASTM A350-LF2
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A234-WPB
		DN200-300	ASTM A420-WPL6

* VALVES

BTFF	BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,NYLON
CHVF	CHECK VALVE FLANGED	DN 15-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A216-WCB/WCC,A105 TRIM: INCOLOY 825,STELLITE 6
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A350-LF2 TRIM: INCOLOY 825,STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A352-LCC,A350-LF2 TRIM: INCOLOY 825

* MISCELLANEOUS

CLBL	BLIND HUB FOR CLAMP COUPLING	DN 15-150	AISI 4140 WITH PTFE COATING
CLHB	HUB FOR CLAMP COUPLING BW END	DN 15-150	ASTM A350-LF2
CLSR	SEAL RING FOR CLAMP COUPLING	DN 15-150	AISI 4140 WITH PTFE COATING
GKSW	GASKET, SPIRAL WOUND	DN 15-300	AISI 316(L),GRAPHITE FILLED CS CENTRING-/SS INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A105
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 251521, REV.O PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE													
PIPE	74.30.03	022.1	032.1	042.1	062.1	075.1	115.1	163.1	229.1				
	74.30.15									144.1	184.1	236.1	
* 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									144.1	184.1	236.1	
* FITTINGS													
CAP BUTT-WELD.END	76.30.17	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1				
	76.31.16									144.1	184.1	236.1	
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				
	76.31.45									144.1	184.1	236.1	
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				
	76.31.47									144.1	184.1	236.1	
EQUAL TEE BUTT-WELD ENDS	76.30.81	573.1	579.1	583.1	593.1	613.1	633.1	653.1	673.1				
	76.31.91									144.1	184.1	236.1	
* VALVES													
BALL VALVE FULL BORE TRUN FLGD	77.00.91					758.1	760.1	762.1	764.1	765.1	766.1	767.1	
BALL VALVE RED. BORE TRUN FLGD	77.00.91					258.1	260.1	262.1	264.1	265.1	266.1	267.1	
CHECK VALVE FLANGED	77.10.43					258.1	260.1	262.1	264.1	265.1	266.1	267.1	
	77.10.78	253.1	254.1	255.1	257.1								
DUAL PL. CHECK VALVE WAFER LUG	77.67.57					258.1	260.1	262.1	264.1	265.1	266.1	267.1	
GLOBE VALVE FLANGED	77.30.53	253.1	254.1	255.1	257.1	258.1	260.1	262.1					
MONOFL SINGLE BLOCK BALL	77.00.97	483.1	484.1	485.1	487.1	488.1							
* MISCELLANEOUS													
BLIND HUB FOR CLAMP COUPLING	76.81.09	028.1	028.1	026.1	034.1	048.1	086.1	110.1	148.1				
CLAMP FOR CLAMP COUPLING	76.81.01			006.1	008.1	010.1	012.1	014.1	018.1				
HUB FOR CLAMP COUPLING BW END	76.81.13	008.1	016.1	026.1	036.1	048.1	088.1	110.1	150.1				
SEAL RING FOR CLAMP COUPLING	76.81.05	006.1	006.1	012.1	030.1	030.1	060.1	078.1	126.1				
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					160.1	164.1	166.1	168.1				

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		30.66.142.1	30.67.142.1	30.88.040.1
25* 15		30.66.152.1	30.67.152.1	30.88.050.1
25* 20		30.66.162.1	30.67.162.1	30.88.060.1
40* 15		30.66.172.1	30.67.172.1	30.88.070.1
40* 20		30.66.182.1	30.67.182.1	30.88.080.1
40* 25		30.66.192.1	30.67.192.1	30.88.090.1
50* 20		30.66.195.1	30.67.195.1	30.88.099.1
50* 25		30.66.202.1	30.67.202.1	30.88.108.1
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	30.88.144.1
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*100		31.64.166.1	31.65.166.1	31.94.166.1
200*150		31.64.200.1	31.65.200.1	31.94.201.1
250* 50	79.09.092.1			
250* 80	79.09.352.1			
250*100		31.64.249.1	31.65.251.1	31.94.236.1
250*150		31.64.281.1	31.65.282.1	31.94.281.1
250*200		31.64.332.1	31.65.332.1	31.94.332.1
300* 50	79.09.143.1			
300* 80	79.09.403.1			
300*100	79.09.653.1			
300*150		31.64.384.1	31.65.384.1	31.94.384.1
300*200		31.64.447.1	31.65.447.1	31.94.446.1
300*250		31.64.510.1	31.65.510.1	31.94.509.1

		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

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 ORIFICE FLANGES

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 130	66.334.1					
20	4	3/4	* 130	66.334.1					
25	4	7/8	* 140	66.404.1					
40	4	1 1/8	* 170	66.532.1					
50	8	1	* 180	66.475.1	50	8	1	* 190	66.477.1
80	8	1 1/4	* 220	66.597.1	80	8	1 1/4	* 230	66.598.1
100	8	1 1/2	* 300	66.696.1	100	8	1 1/2	* 320	66.700.1
150	8	2	* 410	66.825.1	150	8	2	* 420	66.827.1
200	12	2	* 450	66.831.1	200	12	2	* 460	66.834.1
250	12	2 1/2	* 570	86.708.1	250	12	2 1/2	* 570	86.708.1
300	12	2 3/4	* 630	86.784.1	300	12	2 3/4	* 640	86.785.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 140	66.335.1					
20	4	3/4	* 140	66.335.1					
25	4	7/8	* 160	66.407.1					
40	4	1 1/8	* 190	66.535.1					
50	8	1	* 210	66.480.1	50	8	1	* 250	66.486.1
80	8	1 1/4	* 260	66.603.1	80	8	1 1/4	* 320	66.612.1
100	8	1 1/2	* 350	66.704.1	100	8	1 1/2	* 420	66.711.1
150	8	2	* 460	66.834.1	150	8	2	* 560	86.567.1
200	12	2	* 510	86.562.1	200	12	2	* 650	86.576.1
250	12	2 1/2	* 640	86.715.1	250	12	2 1/2	* 830	86.733.1
300	12	2 3/4	* 720	86.793.1					

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK BALL 1 77.00.97.483.1
WELDING NECK FLANGE 1 76.62.80.052.1

* DRAIN POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.97.484.1
WELDING NECK FLANGE 1 76.62.80.054.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK BALL 1 77.00.97.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -300
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.383.1
WELDING NECK FLANGE 2 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.383.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.383.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.383.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.383.1
WELDING NECK FLANGE 1 76.62.80.052.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.554.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.383.1

* TEMPERATURE INSTR.C. DN 40 FIG.AA DN 80 -100
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* TEMPERATURE INSTR.C. DN 40 FIG.BB DN150 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.41.46.562.1

* VENT POINT DN 15 FIG.DF 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 2 85.41.46.554.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.063.1
WELDING NECK FLANGE 1 76.62.80.052.1

* VENT POINT DN 20 FIG.DF 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 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.064.1
WELDING NECK FLANGE 1 76.62.80.054.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.62.10.474.1
GASKET, SPIRAL WOUND 2 85.41.46.556.1
MONOFL SINGLE BLOCK NEEDLE 1 77.30.92.064.1

CLASS 253831

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 50 75 100 120

PRESSURE BAR GA

DN15 -150 425.0 425.0 419.3 409.8 398.4

NOTES

- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
- FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	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	80S
20	80S
25	80S
40	160
50	160
80	160
100	160
150	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.

DUPLEX, UNS S31803	PLANT :	
CLASS NO. : 253831	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE	PIPE	DN 15-150	ASTM A790 UNS S31803

* FLANGES

BLFL	BLIND FLANGE	DN 15-150	ASTM A182-F51
SBFL	SPECTACLE BLIND FLANGE	DN 15-150	ASTM A240 UNS S31803
SPFL	SPADE BLIND	DN 15-150	ASTM A240 UNS S31803
SPRT	SPACER RING TYPE (ASME FLANGE)	DN 15-150	ASTM A240 UNS S31803
WNFL	WELDING NECK FLANGE	DN 15-150	ASTM A182-F51

* FITTINGS

CAPB	CAP BUTT-WELD.END	DN 15-150	ASTM A815-WP-S UNS S31803
E45B	ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
		DN150-150	ASTM A815-WP-S/WX UNS S31803
E90B	ELBOW 90 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
		DN150-150	ASTM A815-WP-S/WX UNS S31803
TEEB	EQUAL TEE BUTT-WELD ENDS	DN 15-150	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIP	BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB	BRANCH OUTLET RED. BUTT WELD	DN150-150	ASTM A182-F51
RECB	REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
		DN150-150	ASTM A815-WP-S/WX UNS S31803
REEB	REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
		DN150-150	ASTM A815-WP-S/WX UNS S31803
TERB	TEE REDUCING BUTT WELD ENDS	DN 20-150	ASTM A815-WP-S UNS S31803

* VALVES

BTFB	BALL VALVE FULL BORE TRUN FLGD	DN 50-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF	BALL VALVE RED. BORE TRUN FLGD	DN 50-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF	CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL	DUAL PL. CHECK VALVE WAFER LUG	DN 50-150	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF	GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF	GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF	MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF	MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT	VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW	GASKET, SPIRAL WOUND	DN 15-150	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
ORFS	ORIFICE FLANGE SET	DN 50-150	ASTM A182-F51
STBT	STUD BOLT WITH NUTS	---	ASTM A193-B7/A194-2H

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE									
PIPE	74.36.58	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1
* FLANGES									
BLIND FLANGE	76.66.01	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1
SPECTACLE BLIND FLANGE	76.88.24	192.1	194.1	196.1	198.1	200.1	202.1	204.1	206.1
SPADE BLIND	76.88.41	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1
SPACER RING TYPE (ASME FLANGE)	76.88.23	452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1
WELDING NECK FLANGE	76.66.29	966.1	968.1	970.1	928.1	930.1	932.1	934.1	936.1
* FITTINGS									
CAP BUTT-WELD.END	76.36.05	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1
* VALVES									
BALL VALVE FULL BORE TRUN FLGD	77.03.81					758.1	760.1	762.1	764.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					258.1	260.1	262.1	264.1
CHECK VALVE FLANGED	77.13.71	253.1	254.1	255.1	257.1				
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					258.1	260.1	262.1	264.1
GATE VALVE FLANGED	77.23.79	303.1	304.1	305.1	307.1				
GLOBE VALVE FLANGED	77.33.41					258.1	260.1	262.1	
	77.33.79	303.1	304.1	305.1	307.1				
MONOFL SINGLE BLOCK BALL	77.03.92	483.1	484.1	485.1	487.1	488.1			
* MISCELLANEOUS									
GASKET, SPIRAL WOUND	85.43.58	254.1	256.1	258.1	262.1	264.1	268.1	270.1	274.1
ORIFICE FLANGE SET	76.66.90					728.1	730.1	732.1	734.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR	-----			
20* 15		36.43.004.1	36.58.004.1	36.83.004.1
25* 15		36.43.022.1	36.58.022.1	36.83.022.1
25* 20		36.43.038.1	36.58.038.1	36.83.038.1
50* 20		36.43.110.1	36.58.110.1	36.83.114.1
50* 25		36.43.132.1	36.58.132.1	36.83.132.1
50* 40		36.43.139.1	36.58.139.1	36.83.139.1
80* 40		36.43.155.1	36.58.155.1	36.83.155.1
80* 50		36.43.173.1	36.58.173.1	36.83.173.1
100* 40		36.43.189.1	36.58.189.1	36.83.189.1
100* 50		36.43.208.1	36.58.208.1	36.83.208.1
100* 80		36.43.227.1	36.58.227.1	36.83.227.1
150* 50	78.51.184.1			
150* 80		36.43.246.1	36.58.246.1	36.83.246.1
150*100		36.43.264.1	36.58.264.1	36.83.264.1

		BNIP
		76.80.34
BRANCH	RUN-PIPE	-----
15	40-150	272.1
20	40- 80	276.1
	100-150	278.1
25	40- 40	279.1
	50- 50	280.1
	80-100	281.1
	150-150	282.1

COMP.	DESCRIPTION
NAME	-----
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	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

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38						81.38					
DN	NR	INCH	*	MM		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	50	8	1	*	250	61.486.1
80	8	1 1/4	*	260	61.603.1	80	8	1 1/4	*	320	61.612.1
100	8	1 1/2	*	350	61.704.1	100	8	1 1/2	*	420	61.711.1
150	8	2	*	460	61.834.1	150	8	2	*	560	83.567.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.202.1
GASKET, SPIRAL WOUND 2 85.43.58.254.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.483.1
WELDING NECK FLANGE 1 76.66.29.966.1

* DRAIN POINT DN 20 FIG.DF DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.484.1
WELDING NECK FLANGE 1 76.66.29.968.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -150
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.883.1
WELDING NECK FLANGE 2 76.66.29.966.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1
WELDING NECK FLANGE 1 76.66.29.966.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.883.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1
WELDING NECK FLANGE 1 76.66.29.966.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1

* VENT POINT DN 15 FIG.DF DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.202.1
GASKET, SPIRAL WOUND 2 85.43.58.254.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.063.1
WELDING NECK FLANGE 1 76.66.29.966.1

* VENT POINT DN 20 FIG.DF DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.064.1
WELDING NECK FLANGE 1 76.66.29.968.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.064.1

CLASS 253832

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-20 120

PRESSURE BAR GA
DN15 -300 308.8 308.8

NOTES

- -----
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
- PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
- THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
- FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
- FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
- WHERE TWO OPTIONS ARE GIVEN FOR PIPE, THE MOST ECONOMIC CHOICE SHOULD BE CHECKED WITH THE SUPPLIER

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	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	80S
20	80S
25	80S
40	80S
50	80S
80	80S
100	120
150	120
200	120
250	140
300	140

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.

DUPLEX, UNS S31803, SOUR	PLANT :	
CLASS NO. : 253832	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPD PIPE (WELDED)	DN250-300	ASTM A928-CL1 UNS S31803
PIPE PIPE	DN 15-300	ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE	DN 15-300	ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE	DN 15-300	ASTM A240 UNS S31803
SPFL SPADE BLIND	DN 15-300	ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE)	DN 15-300	ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE	DN 15- 80	ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END	DN 15-300	ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS	DN 15-100	ASTM A815-WP-S UNS S31803
	DN150-300	ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS	DN 15- 80	ASTM A815-WP-S UNS S31803
	DN100-300	ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS	DN 15-300	ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIP BRANCH FITTING PLAIN-END OUTL.	DN 15- 50	ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD	DN150-300	ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-300	ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS	DN 20-100	ASTM A815-WP-S UNS S31803
	DN150-300	ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS	DN 20-300	ASTM A815-WP-S UNS S31803

* VALVES

BTFF BALL VALVE FULL BORE TRUN FLGD	DN 50-300	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD	DN 50-300	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG	DN 50-300	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GAVF GATE VALVE FLANGED	DN 15- 40	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED	DN 15-100	BODY: ASTM A890-4A,A182-F51 TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL	DN 15- 50	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316, STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD	---	BODY: ASTM A182-F51 TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND	DN 15-300	INCONEL 600,GRAPHITE FILLED DUPLEX CENTRING/INNER RING
ORFS ORIFICE FLANGE SET	DN 50-300	ASTM A182-F51
STBT STUD BOLT WITH NUTS	---	ASTM A193-B7M/A194-2HM

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE												
PIPE (WELDED)	74.36.57										175.1	192.1
PIPE	74.36.58	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	160.1	175.1	192.1
* FLANGES												
BLIND FLANGE	76.66.01	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	218.1	220.1	222.1
SPECTACLE BLIND FLANGE	76.88.24	192.1	194.1	196.1	198.1	200.1	202.1	204.1	206.1	208.1	210.1	212.1
SPADE BLIND	76.88.41	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)	76.88.23	452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	468.1	470.1	472.1
WELDING NECK FLANGE	76.66.29	966.1	968.1	970.1	972.1	974.1	976.1					
* FITTINGS												
CAP BUTT-WELD.END	76.36.05	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	160.1	175.1	192.1
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	160.1	175.1	192.1
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	160.1	175.1	192.1
EQUAL TEE BUTT-WELD ENDS	76.36.74	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	160.1	175.1	192.1
* VALVES												
BALL VALVE FULL BORE TRUN FLGD	77.03.81					758.1	760.1	762.1	764.1	765.1	766.1	767.1
BALL VALVE RED. BORE TRUN FLGD	77.03.81					258.1	260.1	262.1	264.1	265.1	266.1	267.1
CHECK VALVE FLANGED	77.13.71	253.1	254.1	255.1	257.1							
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					258.1	260.1	262.1	264.1	265.1	266.1	267.1
GATE VALVE FLANGED	77.23.79	303.1	304.1	305.1	307.1							
GLOBE VALVE FLANGED	77.33.41					258.1	260.1	262.1				
	77.33.79	303.1	304.1	305.1	307.1							
MONOFL SINGLE BLOCK BALL	77.03.92	483.1	484.1	485.1	487.1	488.1						
* MISCELLANEOUS												
GASKET, SPIRAL WOUND	85.43.58	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	76.66.90					772.1	774.1	807.1	808.1	809.1	821.1	822.1

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR	-----			
20* 15		36.43.004.1	36.58.004.1	36.83.004.1
25* 15		36.43.022.1	36.58.022.1	36.83.022.1
25* 20		36.43.038.1	36.58.038.1	36.83.038.1
40* 15		36.43.054.1	36.58.054.1	36.83.054.1
40* 20		36.43.072.1	36.58.072.1	36.83.072.1
40* 25		36.43.088.1	36.58.088.1	36.83.088.1
50* 20		36.43.104.1	36.58.104.1	36.83.104.1
50* 25		36.43.122.1	36.58.122.1	36.83.122.1
50* 40		36.43.138.1	36.58.138.1	36.83.138.1
80* 40		36.43.154.1	36.58.154.1	36.83.154.1
80* 50		36.43.172.1	36.58.172.1	36.83.172.1
100* 40		36.43.195.1	36.58.195.1	36.83.201.1
100* 50		36.43.215.1	36.58.215.1	36.83.220.1
100* 80		36.43.235.1	36.58.235.1	36.83.239.1
150* 50	78.50.488.1			
150* 80		36.43.253.1	36.58.253.1	36.83.253.1
150*100		36.43.263.1	36.58.263.1	36.83.263.1
200* 50	78.50.490.1			
200* 80	78.50.514.1			
200*100		36.43.283.1	36.58.283.1	36.83.283.1
200*150		36.43.307.1	36.58.307.1	36.83.307.1
250* 50	78.50.650.1			
250* 80	78.50.660.1			
250*100	78.51.080.1			
250*150		36.43.365.1	36.58.365.1	36.83.370.1
250*200		36.43.386.1	36.58.386.1	36.83.401.1
300* 50	78.50.651.1			
300* 80	78.50.661.1			
300*100	78.51.081.1			
300*150		36.43.429.1	36.58.429.1	36.83.433.1
300*200		36.43.450.1	36.58.450.1	36.83.463.1
300*250		36.43.480.1	36.58.480.1	36.83.480.1

	BNIP	
	76.80.34	
BRANCH	RUN-PIPE	-----
15	40-150	272.1
	200-300	274.1
20	40- 80	276.1
	100-300	278.1
25	40- 40	279.1
	50- 50	280.1
	80-100	281.1
	150-300	282.1
40	50- 50	284.1
	80- 80	285.1
	100-100	286.1
	150-300	287.1

COMP.	DESCRIPTION
NAME	-----
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	66.334.1			
20	4	3/4	* 130	66.334.1			
25	4	7/8	* 140	66.404.1			
40	4	1 1/8	* 170	66.532.1			
50	8	1	* 180	66.475.1	50	8	1 * 190
80	8	1 1/4	* 220	66.597.1	80	8	1 1/4 * 230
100	8	1 1/2	* 300	66.696.1	100	8	1 1/2 * 320
150	8	2	* 410	66.825.1	150	8	2 * 420
200	12	2	* 450	66.831.1	200	12	2 * 460
250	12	2 1/2	* 570	86.708.1	250	12	2 1/2 * 570
300	12	2 3/4	* 630	86.784.1	300	12	2 3/4 * 640

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38				81.38			
DN	NR	INCH	* MM	DN	NR	INCH	* MM
15	4	3/4	* 140	66.335.1			
20	4	3/4	* 140	66.335.1			
25	4	7/8	* 160	66.407.1			
40	4	1 1/8	* 190	66.535.1			
50	8	1	* 210	66.480.1	50	8	1 * 250
80	8	1 1/4	* 260	66.603.1	80	8	1 1/4 * 320
100	8	1 1/2	* 350	66.704.1	100	8	1 1/2 * 420
150	8	2	* 460	66.834.1	150	8	2 * 560
200	12	2	* 510	86.562.1	200	12	2 * 650
250	12	2 1/2	* 640	86.715.1	250	12	2 1/2 * 830
300	12	2 3/4	* 720	86.793.1			

ASSEMBLIES

* DRAIN POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.202.1	
GASKET, SPIRAL WOUND	2	85.43.58.254.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.483.1	
WELDING NECK FLANGE	1	76.66.29.966.1	
* DRAIN POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.204.1	
GASKET, SPIRAL WOUND	2	85.43.58.256.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.484.1	
WELDING NECK FLANGE	1	76.66.29.968.1	
* DRAIN POINT	DN 20	FIG.DE	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.204.1	
GASKET, SPIRAL WOUND	2	85.43.58.256.1	
MONOFL SINGLE BLOCK BALL	1	77.03.92.484.1	
* ORIFICE INSTR.CONN.	DN 15	FIG.AB	DN 50 -450
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.43.58.254.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.883.1	
WELDING NECK FLANGE	2	76.66.29.966.1	
* PI ON PIPING CL COUP	DN 15	FIG.CB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.254.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.883.1	
WELDING NECK FLANGE	1	76.66.29.966.1	
* PI ON PIPING CL COUP	DN 15	FIG.CA	DN 50 -450
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.254.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.883.1	

* METERRUN INSTR. CONN	DN 15	FIG.AA	DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	2	85.43.58.254.1	
VALVE ASS DOUB BLOCK BALL THRD	2	77.85.47.883.1	
* PI ON PIPING REMOTE	DN 15	FIG.AB	DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.254.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.883.1	
WELDING NECK FLANGE	1	76.66.29.966.1	
* PI ON PIPING REMOTE	DN 15	FIG.AA	DN 50 -450
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
GASKET, SPIRAL WOUND	1	85.43.58.254.1	
VALVE ASS DOUB BLOCK BALL THRD	1	77.85.47.883.1	
* VENT POINT	DN 15	FIG.DF	DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.202.1	
GASKET, SPIRAL WOUND	2	85.43.58.254.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.063.1	
WELDING NECK FLANGE	1	76.66.29.966.1	
* VENT POINT	DN 20	FIG.DF	DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.204.1	
GASKET, SPIRAL WOUND	2	85.43.58.256.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.064.1	
WELDING NECK FLANGE	1	76.66.29.968.1	
* VENT POINT	DN 20	FIG.DE	DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A)	1	(PIPING COMP.)	
BLIND FLANGE	1	76.66.01.204.1	
GASKET, SPIRAL WOUND	2	85.43.58.256.1	
MONOFL SINGLE BLOCK NEEDLE	1	77.33.46.064.1	

CLASS 253833

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS					
-50	50	75	100	120	
PRESSURE BAR GA					
DN15 -150	425.0	425.0	419.3	409.8	398.4

- NOTES
-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8 AND ASME B31.3 ALLOWABLE INTERNAL PRESSURE, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
 - FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.
 - FOR ECONOMIC/STANDARDISATION REASONS, MATERIAL COMPONENTS (EXCEPT BOLTING) HAS BEEN SELECTED ACC. TO NACE MR-01-75 WITH IMPACT TEST

BRANCH CONNECTIONS 90 DEGREES

RUN SIZE	BRANCH SIZE							
	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	80S
20	80S
25	80S
40	160
50	160
80	160
100	160
150	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.

DUPLEX, UNS S31803, LOW TEMP	PLANT :	
CLASS NO. : 253833	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

DEP 31.38.01.15-GEN. CLASS 253833, REV.A PAGE 2
ISSUE DATE : DECEMBER 1998

* PIPE

PIPE PIPE DN 15-150 ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE DN 15-150 ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE DN 15-150 ASTM A240 UNS S31803
SPFL SPADE BLIND DN 15-150 ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE) DN 15-150 ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE DN 15-150 ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END DN 15-150 ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS DN 15-100 ASTM A815-WP-S UNS S31803
DN150-150 ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS DN 15-100 ASTM A815-WP-S UNS S31803
DN150-150 ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS DN 15-150 ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIP BRANCH FITTING PLAIN-END OUTL. DN 15- 50 ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD DN150-150 ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS DN 20-100 ASTM A815-WP-S UNS S31803
DN150-150 ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS DN 20-100 ASTM A815-WP-S UNS S31803
DN150-150 ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS DN 20-150 ASTM A815-WP-S UNS S31803

* VALVES

BNFF BALL VALVE FB TRUNNION NON EXT DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX,NYLON
BNRF BALL VALVE RB TRUNNION NON EXT DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX,NYLON
BTFF BALL VALVE FULL BORE TRUN FLGD DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED DN 15- 40 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX
GAVF GATE VALVE FLANGED DN 15- 40 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED DN 15-100 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL DN 15- 50 BODY: ASTM A182-F51
TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE --- BODY: ASTM A182-F51
TRIM: ASTM A182-F51,AISI 316,
STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD --- BODY: ASTM A182-F51
TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND DN 15-150 INCONEL 600,GRAPHITE FILLED
DUPLEX CENTRING/INNER RING
ORFS ORIFICE FLANGE SET DN 50-150 ASTM A182-F51
STBT STUD BOLT WITH NUTS --- ASTM A320-L7/A194-4

PIPING COMPONENTS

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 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.58	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1	
* FLANGES										
BLIND FLANGE	76.66.01	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	
SPECTACLE BLIND FLANGE	76.88.24	192.1	194.1	196.1	198.1	200.1	202.1	204.1	206.1	
SPADE BLIND	76.88.41	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	
SPACER RING TYPE (ASME FLANGE)	76.88.23	452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	
WELDING NECK FLANGE	76.66.29	966.1	968.1	970.1	928.1	930.1	932.1	934.1	936.1	
* FITTINGS										
CAP BUTT-WELD.END	76.36.05	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1	
EQUAL TEE BUTT-WELD ENDS	76.36.74	038.1	048.1	058.1	080.1	090.1	110.1	131.1	149.1	
* VALVES										
BALL VALVE FB TRUNNION NON EXT	77.03.86					758.1	760.1	762.1	764.1	
BALL VALVE RB TRUNNION NON EXT	77.03.86					258.1	260.1	262.1	264.1	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					758.1	760.1	762.1	764.1	
BALL VALVE RED. BORE TRUN FLGD	77.03.81					258.1	260.1	262.1	264.1	
CHECK VALVE FLANGED	77.13.71	253.1	254.1	255.1	257.1					
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					258.1	260.1	262.1	264.1	
GATE VALVE FLANGED	77.23.79	303.1	304.1	305.1	307.1					
GLOBE VALVE FLANGED	77.33.41					258.1	260.1	262.1		
	77.33.79	303.1	304.1	305.1	307.1					
MONOFL SINGLE BLOCK BALL	77.03.92	483.1	484.1	485.1	487.1	488.1				
* MISCELLANEOUS										
GASKET, SPIRAL WOUND	85.43.58	254.1	256.1	258.1	262.1	264.1	268.1	270.1	274.1	
ORIFICE FLANGE SET	76.66.90					728.1	730.1	732.1	734.1	

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		36.43.004.1	36.58.004.1	36.83.004.1
25* 15		36.43.022.1	36.58.022.1	36.83.022.1
25* 20		36.43.038.1	36.58.038.1	36.83.038.1
50* 20		36.43.110.1	36.58.110.1	36.83.114.1
50* 25		36.43.132.1	36.58.132.1	36.83.132.1
50* 40		36.43.139.1	36.58.139.1	36.83.139.1
80* 40		36.43.155.1	36.58.155.1	36.83.155.1
80* 50		36.43.173.1	36.58.173.1	36.83.173.1
100* 40		36.43.189.1	36.58.189.1	36.83.189.1
100* 50		36.43.208.1	36.58.208.1	36.83.208.1
100* 80		36.43.227.1	36.58.227.1	36.83.227.1
150* 50	78.51.184.1			
150* 80		36.43.246.1	36.58.246.1	36.83.246.1
150*100		36.43.264.1	36.58.264.1	36.83.264.1

		BNIP
		76.80.34
BRANCH	RUN-PIPE	
15	40-150	272.1
20	40- 80	276.1
	100-150	278.1
25	40- 40	279.1
	50- 50	280.1
	80-100	281.1
	150-150	282.1

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	63.334.1					
20	4	3/4	* 130	63.334.1					
25	4	7/8	* 140	63.404.1					
40	4	1 1/8	* 170	63.532.1					
50	8	1	* 180	63.475.1	50	8	1	* 190	63.477.1
80	8	1 1/4	* 220	63.597.1	80	8	1 1/4	* 230	63.598.1
100	8	1 1/2	* 300	63.696.1	100	8	1 1/2	* 320	63.700.1
150	8	2	* 410	63.825.1	150	8	2	* 420	63.827.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 140	63.335.1					
20	4	3/4	* 140	63.335.1					
25	4	7/8	* 160	63.407.1					
40	4	1 1/8	* 190	63.535.1					
50	8	1	* 210	63.480.1	50	8	1	* 250	63.486.1
80	8	1 1/4	* 260	63.603.1	80	8	1 1/4	* 320	63.612.1
100	8	1 1/2	* 350	63.712.1	100	8	1 1/2	* 420	63.713.1
150	8	2	* 460	63.834.1	150	8	2	* 560	63.838.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.202.1
GASKET, SPIRAL WOUND 2 85.43.58.254.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.483.1
WELDING NECK FLANGE 1 76.66.29.966.1

* DRAIN POINT DN 20 FIG.DF DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.484.1
WELDING NECK FLANGE 1 76.66.29.968.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -150
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.883.1
WELDING NECK FLANGE 2 76.66.29.966.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1
WELDING NECK FLANGE 1 76.66.29.966.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1

* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.883.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1
WELDING NECK FLANGE 1 76.66.29.966.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1

* VENT POINT DN 15 FIG.DF DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.202.1
GASKET, SPIRAL WOUND 2 85.43.58.254.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.063.1
WELDING NECK FLANGE 1 76.66.29.966.1

* VENT POINT DN 20 FIG.DF DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.064.1
WELDING NECK FLANGE 1 76.66.29.968.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.064.1

CLASS 253834

DESIGN LIMITS

TEMPERATURE IN DEGREES CELSIUS
-50 120

PRESSURE BAR GA
DN15 -150 308.8 308.8

NOTES

-
- DESIGN LIMITS ACC.TO ASME B16.5 FLANGE RATING MAT.GRP 2.8, AND LIMITED BY ALLOWABLE STRESS OF BOLTING MATERIAL
 - PISTON TYPE CHECK VALVES FOR HORIZONTAL MOUNTING ONLY
 - THE USE OF RED. BORE BALL VALVES IS PREFERRED, USE FULL BORE BALL VALVES ONLY WHEN NECESSARY FOR PROCESS/OPERATING REQUIREMENTS.
 - FOR FULLY OPERATIONAL BALL VALVES, FULLY TESTABLE TO MESC SPEC 77/306, SELECT BTRF OR BTFF.
 - FOR NON-OPERATIONAL BALL VALVES, ONLY TESTABLE FOR EXTERNAL LEAKAGE AT -50 DEG C, SELECT BNRF OR BNFF.
 - FOR BENDING OF PIPE SEE DEP 31.38.01.31-GEN.
 - FOR STANDARDISATION, FLEXIBILITY, AND INTEGRITY, DBB VALVE IS SHOWN ON ALL PRESSURE CONNECTIONS.
 - A MONO-FLANGE VALVE MAY BE USED FOR PI REMOTE AND ORIFICE INSTRUMENT ASSEMBLIES IF PREFERRED FOR LOWER COST.

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	80S
20	80S
25	80S
40	80S
50	80S
80	80S
100	120
150	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.

DUPLEX, UNS S31803, LT SOUR	PLANT :	
CLASS NO. : 253834	CONSIGNEE :	
ANS RATING : CLASS 2500	ENGINEERED BY :	
CORR. ALL. : 0 mm.	PRINCIPAL :	
REV. LETTER : A	CONTR.JOB NO. :	
REV. DATE : 12/98	PROJECT NO. :	

ISSUE DATE : DECEMBER 1998

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

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ISSUE DATE : DECEMBER 1998

* PIPE

PIPE PIPE DN 15-150 ASTM A790 UNS S31803

* FLANGES

BLFL BLIND FLANGE DN 15-150 ASTM A182-F51
SBFL SPECTACLE BLIND FLANGE DN 15-150 ASTM A240 UNS S31803
SPFL SPADE BLIND DN 15-150 ASTM A240 UNS S31803
SPRT SPACER RING TYPE (ASME FLANGE) DN 15-150 ASTM A240 UNS S31803
WNFL WELDING NECK FLANGE DN 15- 80 ASTM A182-F51

* FITTINGS

CAPB CAP BUTT-WELD.END DN 15-150 ASTM A815-WP-S UNS S31803
E45B ELBOW 45 DEG BUTT-WELD ENDS DN 15-100 ASTM A815-WP-S UNS S31803
DN150-150 ASTM A815-WP-S/WX UNS S31803
E90B ELBOW 90 DEG BUTT-WELD ENDS DN 15- 80 ASTM A815-WP-S UNS S31803
DN100-150 ASTM A815-WP-S/WX UNS S31803
TEEB EQUAL TEE BUTT-WELD ENDS DN 15-150 ASTM A815-WP-S UNS S31803

* REDUCING FITTINGS

BNIP BRANCH FITTING PLAIN-END OUTL. DN 15- 50 ASTM A182-F51
BROB BRANCH OUTLET RED. BUTT WELD DN150-150 ASTM A182-F51
RECB REDUCER CONC BUTT WELD ENDS DN 20-100 ASTM A815-WP-S UNS S31803
DN150-150 ASTM A815-WP-S/WX UNS S31803
REEB REDUCER ECC BUTT WELD ENDS DN 20-100 ASTM A815-WP-S UNS S31803
DN150-150 ASTM A815-WP-S/WX UNS S31803
TERB TEE REDUCING BUTT WELD ENDS DN 20-150 ASTM A815-WP-S UNS S31803

* VALVES

BNFF BALL VALVE FB TRUNNION NON EXT DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX,NYLON
BNRF BALL VALVE RB TRUNNION NON EXT DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX,NYLON
BTFF BALL VALVE FULL BORE TRUN FLGD DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX,NYLON
BTRF BALL VALVE RED. BORE TRUN FLGD DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX,NYLON
CHVF CHECK VALVE FLANGED DN 15- 40 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX
CHWL DUAL PL. CHECK VALVE WAFER LUG DN 50-150 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX
GAVF GATE VALVE FLANGED DN 15- 40 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX
GLVF GLOBE VALVE FLANGED DN 15-100 BODY: ASTM A890-4A,A182-F51
TRIM: DUPLEX
MSBF MONOFL SINGLE BLOCK BALL DN 15- 50 BODY: ASTM A182-F51
TRIM: ASTM A182-F51,AISI 316
MSNF MONOFL SINGLE BLOCK NEEDLE --- BODY: ASTM A182-F51
TRIM: ASTM A182-F51,AISI 316,
STELLITE 6
VDBT VALVE ASS DOUB BLOCK BALL THRD --- BODY: ASTM A182-F51
TRIM: ASTM A182-F51,AISI 316

* MISCELLANEOUS

GKSW GASKET, SPIRAL WOUND DN 15-150 INCONEL 600,GRAPHITE FILLED
DUPLEX CENTRING/INNER RING
ORFS ORIFICE FLANGE SET DN 50-150 ASTM A182-F51
STBT STUD BOLT WITH NUTS --- ASTM A320-L7M/A194-7M

PIPING COMPONENTS

DEP 31.38.01.15-GEN. CLASS 253834, REV.A PAGE 3
 ISSUE DATE : DECEMBER 1998

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

* PIPE										
PIPE	74.36.58	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	
* FLANGES										
BLIND FLANGE	76.66.01	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	
SPECTACLE BLIND FLANGE	76.88.24	192.1	194.1	196.1	198.1	200.1	202.1	204.1	206.1	
SPADE BLIND	76.88.41	202.1	204.1	206.1	208.1	210.1	212.1	214.1	216.1	
SPACER RING TYPE (ASME FLANGE)	76.88.23	452.1	454.1	456.1	458.1	460.1	462.1	464.1	466.1	
WELDING NECK FLANGE	76.66.29	966.1	968.1	970.1	972.1	974.1	976.1			
* FITTINGS										
CAP BUTT-WELD.END	76.36.05	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	
ELBOW 45 DEG BUTT-WELD ENDS	76.36.15	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	
ELBOW 90 DEG BUTT-WELD ENDS	76.36.25	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	
EQUAL TEE BUTT-WELD ENDS	76.36.74	038.1	048.1	058.1	078.1	088.1	108.1	129.1	148.1	
* VALVES										
BALL VALVE FB TRUNNION NON EXT	77.03.86					758.1	760.1	762.1	764.1	
BALL VALVE RB TRUNNION NON EXT	77.03.86					258.1	260.1	262.1	264.1	
BALL VALVE FULL BORE TRUN FLGD	77.03.81					758.1	760.1	762.1	764.1	
BALL VALVE RED. BORE TRUN FLGD	77.03.81					258.1	260.1	262.1	264.1	
CHECK VALVE FLANGED	77.13.71	253.1	254.1	255.1	257.1					
DUAL PL. CHECK VALVE WAFER LUG	77.68.41					258.1	260.1	262.1	264.1	
GATE VALVE FLANGED	77.23.79	303.1	304.1	305.1	307.1					
GLOBE VALVE FLANGED	77.33.41					258.1	260.1	262.1		
	77.33.79	303.1	304.1	305.1	307.1					
MONOFL SINGLE BLOCK BALL	77.03.92	483.1	484.1	485.1	487.1	488.1				
* MISCELLANEOUS										
GASKET, SPIRAL WOUND	85.43.58	254.1	256.1	258.1	262.1	264.1	268.1	270.1	274.1	
ORIFICE FLANGE SET	76.66.90					772.1	774.1	807.1	808.1	

	BROB	RECB	REEB	TERB
	76.	76.	76.	76.
RUN* BR				
20* 15		36.43.004.1	36.58.004.1	36.83.004.1
25* 15		36.43.022.1	36.58.022.1	36.83.022.1
25* 20		36.43.038.1	36.58.038.1	36.83.038.1
40* 15		36.43.054.1	36.58.054.1	36.83.054.1
40* 20		36.43.072.1	36.58.072.1	36.83.072.1
40* 25		36.43.088.1	36.58.088.1	36.83.088.1
50* 20		36.43.104.1	36.58.104.1	36.83.104.1
50* 25		36.43.122.1	36.58.122.1	36.83.122.1
50* 40		36.43.138.1	36.58.138.1	36.83.138.1
80* 40		36.43.154.1	36.58.154.1	36.83.154.1
80* 50		36.43.172.1	36.58.172.1	36.83.172.1
100* 40		36.43.195.1	36.58.195.1	36.83.201.1
100* 50		36.43.215.1	36.58.215.1	36.83.220.1
100* 80		36.43.235.1	36.58.235.1	36.83.239.1
150* 50	78.50.488.1			
150* 80		36.43.253.1	36.58.253.1	36.83.253.1
150*100		36.43.263.1	36.58.263.1	36.83.263.1

		BNIP
		76.80.34
BRANCH	RUN-PIPE	
15	40-150	272.1
20	40- 80	276.1
	100-150	278.1
25	40- 40	279.1
	50- 50	280.1
	80-100	281.1
	150-150	282.1
40	50- 50	284.1
	80- 80	285.1
	100-100	286.1
	150-150	287.1

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	67.334.1					
20	4	3/4	* 130	67.334.1					
25	4	7/8	* 140	67.404.1					
40	4	1 1/8	* 170	67.532.1					
50	8	1	* 180	67.475.1	50	8	1	* 190	67.477.1
80	8	1 1/4	* 220	67.597.1	80	8	1 1/4	* 230	67.598.1
100	8	1 1/2	* 300	67.696.1	100	8	1 1/2	* 320	67.700.1
150	8	2	* 410	67.825.1	150	8	2	* 420	67.827.1

BOLTSET SPECTACLE/SPACER

BOLTSET WAFER CHECK VALVE

81.38					81.38				
DN	NR	INCH	* MM		DN	NR	INCH	* MM	
15	4	3/4	* 140	67.335.1					
20	4	3/4	* 140	67.335.1					
25	4	7/8	* 160	67.407.1					
40	4	1 1/8	* 190	67.535.1					
50	8	1	* 210	67.480.1	50	8	1	* 250	67.487.1
80	8	1 1/4	* 260	67.603.1	80	8	1 1/4	* 320	67.612.1
100	8	1 1/2	* 350	67.704.1	100	8	1 1/2	* 420	67.710.1
150	8	2	* 460	67.833.1	150	8	2	* 560	67.838.1

ASSEMBLIES

* DRAIN POINT DN 15 FIG.DF DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.202.1
GASKET, SPIRAL WOUND 2 85.43.58.254.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.483.1
WELDING NECK FLANGE 1 76.66.29.966.1

* DRAIN POINT DN 20 FIG.DF DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.484.1
WELDING NECK FLANGE 1 76.66.29.968.1

* DRAIN POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK BALL 1 77.03.92.484.1

* ORIFICE INSTR.CONN. DN 15 FIG.AB DN 50 -150
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.883.1
WELDING NECK FLANGE 2 76.66.29.966.1

* PI ON PIPING CL COUP DN 15 FIG.CB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1
WELDING NECK FLANGE 1 76.66.29.966.1

* PI ON PIPING CL COUP DN 15 FIG.CA DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1

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* METERRUN INSTR. CONN DN 15 FIG.AA DN 15 - 40
Branch: (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 2 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 2 77.85.47.883.1

* PI ON PIPING REMOTE DN 15 FIG.AB DN 15 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1
WELDING NECK FLANGE 1 76.66.29.966.1

* PI ON PIPING REMOTE DN 15 FIG.AA DN 50 -150
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
GASKET, SPIRAL WOUND 1 85.43.58.254.1
VALVE ASS DOUB BLOCK BALL THRD 1 77.85.47.883.1

* VENT POINT DN 15 FIG.DF DN 15 - 25
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.202.1
GASKET, SPIRAL WOUND 2 85.43.58.254.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.063.1
WELDING NECK FLANGE 1 76.66.29.966.1

* VENT POINT DN 20 FIG.DF DN 40 - 40
Branch:N (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.064.1
WELDING NECK FLANGE 1 76.66.29.968.1

* VENT POINT DN 20 FIG.DE DN 50 -300
Branch:S (:N=br.tab,:S=BNIF,: =N/A) 1(PIPING COMP.)
BLIND FLANGE 1 76.66.01.204.1
GASKET, SPIRAL WOUND 2 85.43.58.256.1
MONOFL SINGLE BLOCK NEEDLE 1 77.33.46.064.1