TECHNICAL SPECIFICATION

MANUFACTURING REPORT FOR PRESSURE VESSELS

DEP 31.22.10.35-Gen.

May 1992

DESIGN AND ENGINEERING PRACTICE

USED BY

COMPANIES OF THE ROYAL DUTCH/SHELL GROUP

PREFACE

DEP (Design and Engineering Practice) publications reflect the views, at the time of publication, of:

Shell International Oil Products B.V. (SIOP)
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and
Shell International Chemicals B.V. (SIC)

The Hague, The Netherlands,

and other Service Companies.

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.

The right to use DEPs is granted by SIOP, SIEP or SIC, in most cases under Service Agreements primarily with companies of the Royal Dutch/Shell Group and other companies receiving technical advice and services from SIOP, SIEP or SIC. Consequently, three categories of users of DEPs can be distinguished:

1) Operating companies having a Service Agreement with SIOP, SIEP, SIC or other Service Company. The use of DEPs by these Operating companies is subject in all respects to the terms and conditions of the relevant Service Agreement.

2) Other parties who are authorized to use DEPs subject to appropriate contractual arrangements.

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.

Subject to any particular terms and conditions as may be set forth in specific agreements with users, SIOP, SIEP and SIC disclaim any liability of whatsoever nature for any damage (including injury or death) suffered by any company or person whomsoever as a result of or in connection with the use, application or implementation of any DEP, combination of DEPs or any part thereof. The benefit of this disclaimer shall inure in all respects to SIOP, SIEP, SIC and/or any company affiliated to these companies that may issue DEPs or require the use of DEPs.

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

TABLE OF CONTENTS

1. INTRODUCTION

1.1 SCOPE

This DEP gives guidelines and minimum requirements for the compilation of a manufacturing report which shall be drawn up by the manufacturer for each pressure vessel (as defined in 1.3).

This DEP is a revision of an earlier DEP of the same number and title, dated July 1984.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

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

This DEP is intended for use in oil refineries, chemical plants, gas plants, supply/marketing installations and, where applicable, in exploration and production**.**

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 document 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 document as closely as possible.

1.3 DEFINITIONS

Within this DEP the following definitions apply:

1.3.1 General Definitions

Pressure vessel means a vessel of metallic materials, of fusion welded construction, designed and built in accordance with B55500, DEP 31.22.10.31-Gen., ASME VIII Div 1 or 2, and DDD 31.22.20.31-Gen.

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

The **Manufacturer/Supplier** is the party which manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party which initiates the project and ultimately pays for its design and construction. 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

Cross references to other parts of this DEP are shown in brackets. Referenced standards are listed in (5).

2. GENERAL REQUIREMENTS

The manufacturing report for each pressure vessel shall be compiled in accordance with this DEP and the applicable code(s).

The report shall be written in English, or shall include an English translation.

The contents of the manufacturing report shall:

- reflect in detail the fabrication history of the pressure vessel concerned;
- provide all information to demonstrate that applicable quality procedures have been followed and standards adhered to;
- state the compliance with the specifications invoked by the purchase order.

In the Appendices are specimen copies of layouts of a full and an abridged* manufacturing report, respectively. They identify the minimum contents to be included in reports.

Separate copies are available as DEP 31.22.10.41-Gen. and DEP 31.22.10.42-Gen. respectively.

As fabrication of the equipment progresses, the manufacturer shall compile the manufacturing report with the original manufacturing documents** and shall keep it up-to-date. It shall be presented to the Purchaser or his nominee upon his request.

The manufacturing report shall, after being accepted by clear endorsement of each page by stamp, date and signature of the nominated inspector, be submitted to the Principal. The original and the required number of copies shall be forwarded promptly after the completion of the equipment in accordance with the terms and conditions of the purchase order. If the order is subject to inspection by Purchaser, the release note for the acceptance of the equipment shall only be issued when the manufacturing report, including the required number of copies, is presented.

* The abridged manufacturing report may be used for pressure vessel parts or vessels for non-severe operating conditions and for non-code vessels, if agreement is obtained from the Principal or his nominee.

** In case the requirement for originals (including certificates) cannot be met, a legible master copy shall be offered, duly marked as such.

3. COMPILATION OF THE MANUFACTURING REPORT

3.1 COVER

Each manufacturing report shall have a cover sheet of A-4 size paper on which is printed:

- Manufacturing Report;
- Equipment plant number, e.g. C-201, E-201, V-201;
- Name of the project/plant (when available);
- Principal's purchase order number.

The report shall be provided in loose-leaf form with numbered pages (Page ... of ...).

3.2 LIST OF CONTENTS

The list of contents shall contain the following data:

- Name and address of the manufacturer;
- Principal's complete purchase order number;
- Equipment plant number and name, e.g. E-303 'Charge effluent exchanger';
- Manufacturer's production works order number;
- Name and address of the inspection organization (when applicable);
- Name and signature of the nominated inspector (when applicable).

3.3 SHEETS

All sheets shall contain:

- Name and address of the manufacturer;
- Principal's purchase order number;
- Equipment plant number and name;
- Page number;
- Manufacturers production works order number.

For further details see (4). If any item on the sheet is not relevant, it shall be indicated on the list of contents as: 'Not Applicable' or 'NA'.

3.4 ATTACHMENTS

Each page of pertinent attachment documents, e.g. certificates, repair reports, sketches, deviations and concessions etc., shall be attached immediately behind the relevant sheets and shall be clearly marked with:

- Principal's purchase order number;
- Equipment plant number and name;
- Relevant section letter and page number.

Certificates for a part of the vessel shall show the name of the relevant part, its purchase order and item numbers, e.g. shell, channel, head, nozzle A-2, tubes, flanges, bolts, internals etc.

If material mill certificates are applicable only to certain parts of the vessel, the applicable items shall be marked with an arrow and numbered on an included, duly marked copy of the original certificate. A cross-reference of this certificate number should be included in as built drawings, alongside appropriate parts.

3.5 DEVIATIONS AND CONCESSIONS

Copies of Principal's letter or telex approval for any deviations or concessions from the purchase order requirements shall be included in the manufacturing report.

4. GUIDANCE FOR APPLICATION OF SHEETS

4.1 FULL MANUFACTURING REPORT (See Appendix 1)

- Section A1

  Shall be completed with all applicable data.

- Section A2

  The certificate of conformance (design) shall be issued reviewed and accepted by Principal prior to commencement of manufacture.

- Section A3

  The certificate of conformance (manufacture assembly and testing) shall be issued for review and acceptance by Principal or nominee prior to release for shipment.

- Section B

  All deviations and concessions shall be listed and described. Evidence of authorized approvals shall be attached to this sheet, e.g. copy of telex or letter.

- Section C

  All construction materials shall be listed.

  If an alloy verification is required, this shall be indicated. For certificates see (3.4).

- Section D

  Design strength values shall be stated for all parts of the equipment subject to stress calculations.

- Section E

  Sheet 1 and 2

  These sheets shall be completed for every type of welding method.

  Sheet 3 and 4

  Details of welders involved in production welding of pressure vessel.

- Section F1

  Indicate the applied methods, e.g.:

  - Radiography (X-ray, gamma-ray)
  - Ultrasonics
  - Magnetic particle
  - Liquid penetrant
  - Hardness testing

  A separate sheet shall be used for each method of non-destructive examination (NDE) specified in the purchase order.

- Section F2

  For radiography, a list shall be attached with the interpretation results of radiographs. This list shall be duly signed by the seller's authorized approval party.

- Section F3/4

  This sheet is self-explanatory.

- Section F5 (no sheet provided)

  Full details of all quality control activities on glass lining (if applicable) shall be entered. These should satisfy specific order requirements but as a minimum should include the following information:

1. Statement that the manufacturer will maintain:

   - Complete quality control records;

- Test reports;
  in accordance with requirements of applicable code
  in accordance with own quality assurance manual
- (to be added) Requirements as per various applicable DEP's.

2. Certification by:

   - Certified record of inspection and testing;
   - Statement of compliance with the specification (DEP) and the certificates.

   Records of inspection and testing to contain at least:

   - Name of manufacturer;
   - Item(s) and item description;
   - Ordering details;
   - Drawing number(s);
   - Type and extent of testing - intermediate*;
     - final*;
     - re-testing*;
   - Result of visual inspection*;
   - Result of high voltage spark testing*;
   - Result of Statiflux testing (if applicable)*;
   - Result of glass lining thickness testing*;
   - Sketch giving position and number repair plugs*;
   - Results of dimensional/tolerances testing*;
   - Result of hydraulic pressure testing;
   - Result of compliance testing;
   - Testing date, name and signature of inspector(s).

   * Tests particularly holding for glass lined items

- Section F6 (no sheet provided)

  Full details of all quality control activities on rubber lining (if applicable) shall be entered. These should verify conformity to requirements of DEP 30.48.60.30-Gen.

- Section G (no sheet provided)

All repairs and related heat treatments shall be reported. Locations of repairs shall be shown on the as-built drawings. The results of additional NDE shall be reported in the appropriate sections.

- Section H

  In case of re-heat treatment due to repair, an additional sheet for the re-heat treatment shall also be completed.

- Section I

  Deviations from the design location of nozzles, manholes, etc. shall be shown with plus or minus values.

- Section J1

  The maximum deviation allowed by the Purchase Order shall also be indicated and shall be recorded on a separate sheet Section J2. See DEP 31.22.10.32-Gen. and BS 5500 or ASME Section VIII, Div. 1 and Div. 2.

- Section J2

  Indicate the maximum deviations allowed by the Purchase Order.

- Section K

  This sheet shall be used for recording the painting/coating systems details, both specified and actual. Provision is made to verify:

  - That surface preparation is to a referenced code/standard.
  - The conditions of humidity during various layer applications.
  - That continuity of painting/coating, the method used and results, have been checked.
  - That satisfactory adhesion/cohesion has been demonstrated by means of test

samples.

- Section L

  Water shall normally be used as the pressurizing agent. Where other liquids are used, additional precautions may be necessary depending on the nature of the liquid. Attention is drawn to the need to control the chloride content of test water in case of austenitic stainless steel equipment.

- Section M

  This sheet is self-explanatory

- Section N (no sheet provided)

  This is a copy of the final release note.

- Section O (no sheet provided)

  This is the as-built drawing. It shall be certified and signed by the manufacturer.

- Section P

  A copy of the manufacturers accepted Quality Control plan to be incorporated (where applicable).

4.2 ABRIDGED MANUFACTURING REPORT (See Appendix 2)

The documents required depend on the specific duty of the equipment..

Factors which should be taken into consideration when deciding if abridged report is applicable include:

- Requirements of design code;
- Criticality of service;
- Simplicity of design;
- Size/volume;
- Total cost.

In each case, the decision should be made clear at the time of placing purchase, order and it must be acceptable to Principal.

5. REFERENCES

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

NOTE: Unless specifically designated by date, the latest edition of each publication shall be used, together with any amendments/supplements/revisions thereto.

SHELL STANDARDS

Index to DEP Publications and Standard Specifications	DEP 00.00.05.05-Gen.
Standard forms (binder)	Dep 00.00.10.05-Gen.
Pressure vessels (Amendments/supplements to BS 5500)	DEP 31.22.10.31-Gen.
Standard form (full manufacturing report)	DEP 31.22.10.41-Gen
Standard form (abridged manufacturing report)	DEP 31.22.10.42-Gen.
Pressure vessels (Amendments/supplements to ASME Section VIII, Div. 1 and Div. 2)	DDD 31.22.20.31-Gen.

BRITISH STANDARD

Unfired fusion welded pressure vessels	BS 5500

Issued by:
British Standard Institution,
2 Park Street, London W1A 2BS
England

AMERICAN STANDARD

ASME Boiler and Pressure Vessel Code Section VIII, Div. 1 and Div. 2	ASME VIII

Issued by:
American Society of Mechanical Engineers,
345 East 47th Street,
New York, N.Y. 10017,
USA

APPENDICES

Specimen copies of the following forms are included on the subsequent pages. The latest version of each form should be used and can be found in the Standard Forms binder, which is DEP 00.00.10.05-Gen.

Full Manufacturing Report (22 sheets).

Abridged Manufacturing Report (1 sheet).

LIST OF CONTENTS

Name and address of manufacturer :

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

DESCRIPTION	Section	No. of sh
General data	A1	
Copy of release note	N*	
Certificate of conformance (design)		
Certificate of conformance (construction and testing)		
List of authorized deviations and/or concessions		
List of construction materials/alloy verification/certificates		
List of material design strength data		
Welding procedure (details)		
Welding procedure (test results)		
List of welders and welding operators		
Welder approval test record	E4	
Non-destructive examinations:		
List of NDE methods	F1	
Radiography (details)	F2	
Wall thickness me	F3	
Wall thickne	F4	
QC con	F5*	
QC	F6*	
Re ort of additional NDE in appropriate section,		
	G*	
	H	
ions)	I	
ness/misalignment (high-low)	J1/2	
	K	
ate	L	
neplate or stamping	M	
general assembly drawing (certified and signed)	O*	
Quality Control Plan	P*	

* No sheet provided

NOTE: Delete what does not apply

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

GENERAL DATA

Name and address of manufacturer : Section A1, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Applicable design code : .....

Year of manufacture : ..... Manufacturer's serial No. : .....

Name of design org. : .....

Name of inspection org. : .....

Type of vessel : horizontal/vertical*; clad/lined/coated*

Design pressure, bar(ga) : .....

Design temperature, (Min./Max.) : .....

ID/OD*, mm : .....

Wall thickness, (Actual) mm : .....

Corrosion allowance, mm : .....

Overall length of vessel : .....

Weight of vessel (empty) : .....

Heat treatment : yes/no*

Pressure test date : .....

Position : horizon

Test pressure :

Test medium

Temperature of mediu

NDE : - radio

.....

.....

.....

e/suspended*

..... Rev. No.: .....

..... Rev. No.: .....

..... Rev. No.: .....

..... Rev. No.: .....

..... Rev. No.: .....

..... Rev. No.: .....

hat does not apply

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

CERTIFICATE OF CONFORMANCE(design)

Name and address of manufacturer : Section A2, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

We hereby certify that the design of this vessel conforms to:

Code : .....

Purchase order No. : ..... Rev. : ..... Dat

Requisition No. : ..... Rev. : .....

Additional requirements : .....

For design organization : .....

Name : .....

Position : .....

Name of company : .....

Place and date : .....

Signature and stamp

We hereby confirm that the de ..d by: (* .....)
as complying with the spe

* Here state name ..ominee).

NOTE ..inted.

For ..... : .....

Signature and stamp

.s not apply.

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

CERTIFICATE OF CONFORMANCE(construction and testing)

Name and address of manufacturer : Section A3, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

We hereby certify that this equipment has been constructed and tested in conformity with:

Code : .....

Purchase order No. : ..... Rev. : ..... Dated

Requisition No. : ..... Rev. : .....

Additional requirements : .....

For manufacturer : .....

Name : .....

Position : .....

Name of company : .....

Place and date : .....

Signature and stamp

We hereby confirm that (except for * the above equipment has been carried out under surveillance and that to the best of our knowledge and belief it has been constructed and tested in accordance with the requirements of the above code, purchase order, requisition

* Delete words between * immediately hereunder.

.....

.....

.....

.....

.....

.....

.....

.....

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

LIST OF AUTHORIZED DEVIATIONS AND/OR CONCESSIONS

Name and address of manufacturer : Section B, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Non-Conformity No.	Part of Equipment	Description of the Non-Conformity	Manufacturer NCR No.	Manufacturer C.A. No.	Repair/ Replacement	Waiver/ Concession	Correspond Ref

Signature and stamp

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

LIST OF CONSTRUCTION MATERIALS/ALLOY VERIFICATION/CERTIFICATES

Name and address of manufacturer : Section C, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Drawing No.:				Materials				
No.	Part of Equipment	Pos. No.	Qty	Specified	Actually used	Alloy verification Yes/No	Heat No./ Charge No.	Level of certific
1								
2								
3								

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

LIST OF MATERIAL DESIGN STRENGTH DATA

Name and address of manufacturer : Section D, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Part of equipment	Identification of material actually used	Design temperature, °C	Nominal [1] design strength, N/mm²	Reference [2] strength, N/mm²	Reference document

NOTES:

1) ...sed on two or more reference strength values, a detailed derivation shall be attached.

2) ...the code requirements, the nominal design strength has been based (yield, tensile or creep rupture strength value).

...ength or the nominal design strength value(s) has been taken.

...d to be proven by destructive mechanical testing (tensile tests, charpy impact tests) these test certificates should be attached.

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

WELDING PROCEDURE (details)

Name and address of manufacturer : Section E1, sheet of

Principal's purchase order No. : Item No. :

Equipt. plant No. and name :

Manufacturer's production order No. :

Manufacturer's procedure No. (and revision No.): Test record No.:

Welding process(es) :
Joint type :
Welding position(s) :
Test piece position :

Parent material(s)
Specification:
Materials group(s):
Dimensions of test piece:

Weld preparation (dimensional sketch):

Run sequence and completed weld dimensio

Method of preparation and cleaning:

Welding co
Run No
Si / AC / DC

Welding consumables
Filler material :
Make and type :
Composition :
Shielding gas/flux :
Make and type :
Composition :
Baking treatment :

Second side treatment

eatment
:
:
ntrol :
Soak temperature : °C
Soak time : h

Preheat
Interpa
Ot

Welder's identity
Name :
Mark :

Remarks:

ess(es) :
iameters :

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

WELDING PROCEDURE QUALIFICATION(test results)

Name and address of manufacturer : Section E2, sheet of

Principal's purchase order No. : Item No. :

Equipt. plant No. and name :

Manufacturer's production order No. :

NON-DESTRUCTIVE TESTS	Test record No. :
Visual:	Radiography :
Magnetic particle or dye penetrant:	Ultrasonic :

DESTRUCTIVE TESTS

Test	Tensile strength	Yield strength	Elongation	Reduct. of area	Fracture locati
Units	N/mm²	N/mm²	%	%	
Transverse tensile					
All-weld tensile					

Bend tests			**Fillet weld fracture (m**
Orientation	Former diameter	Results	1
Root/face/side			2
Root/face/side			3
Root/face/side			
Root/face/side			
Longitudinal			

Hardness survey type: ..... load: ...

	Hardness range
Parent material	.....
H.A.Z.	.....
Weld	.....

Impact tests

Specimen location and size		Results (with units)

A

xamination, ferrite measurement, etc.:

.....

.....

.....

rect. The test welds were prepared, welded and tested in accordance with the requirements of the applicable codes

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

LIST OF WELDERS AND WELDING OPERATORS

Name and address of manufacturer : ... Section E3, sheet of

Principal's purchase order No. : ... Item No. : ...

Equipt. plant No. and name : ...

All welding on the equipment covered by the above mentioned order was done by the welders mentioned below.

Name	Identification mark	Welder's certificate			Authority which certified welder examination
		Number	Issued on	Date of last certification	

SPECIMEN
USE LATEST VERSION

For manufacturer : ...

Position : ...

Place and date : ...

WELDER APPROVAL TEST RECORD*

Name and address of manufacturer : Section E4, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Welder's name :	Welder's identity No.: .....
Approval test No. :	Date of test: ..... / Shop or site test: .....
Welding procedure No. :	Welding process and polarity: .....
Parent material(s)	**Welding consumables**
Type :	Electrode or filler material
Thickness :	Specification
Pipe outside diameter or dimension :	Type of flux or [illegible]
Welding position :	Pip[illegible] .....
Type of joint with sketch of weld preparation:	.....
	.....

Approval test results : .....

(State: s[illegible] ate any results of re-tests)

Non-destructive tests

Visual .....

Magnetic particle .....

Dye pene[illegible] .....

R[illegible] .....

.....

.....

.....

: .....

[illegible] : .....

[illegible]est with any remarks : .....

[illegible]pection organization:	For welder's employer: .....
.....	Position: .....
Witnessed by:	Name of company: .....
Place and date:	Place and date: .....
Signature and Stamp	Signature and Stamp

Endorsements (intervals of six months):

*One sheet to be completed for one test

LIST OF NDE METHODS

Name and address of manufacturer : Section F1, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

List of NDE methods and standard/code applied:

Methods	Applicable standard/code

Repairs:

P	Acceptable Yes/No	Remarks

::	For inspection organization:
osition:	Name:
	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

RADIOGRAPHY (details)

Name and address of manufacturer : Section F2, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Method of radiography (X-ray/gamma-ray *): .....

Source strength: .....

Film name and type (sensitivity) : .....

.....

* Delete what does not apply

Outline sketch (state zero ma··· ···was started) or manufacturer's sketch to be attached.

	Weld No.	Pass/Fail	Remarks

For manufacturer:

Name:

Position:

Place and date:

Signature and stamp

For inspection organization:

Name:

Position:

Name of company:

Place and date:

Signature and stamp

WALL THICKNESS MEASUREMENT (shell)

Name and address of manufacturer : Section F3, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Shell layout

...asonic instrument used:

.....

...nufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

WALL THICKNESS MEASUREMENTS ("Other" components)

Name and address of manufacturer : Section F4, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Part of equipment	Wall thickness in mm	Remarks

.strument used:

.osition:	For inspection organization:
	Name:
	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

HEAT TREATMENT CERTIFICATE

Name and address of manufacturer : Section H, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Stress relieved by

Name of company : .....

Address : .....

Date : .....

Method of heat treatment (stress relief, normalizing etc.) : .....

Required temperature : .....°C

Maximum material thickness (shell or heads) : ..... mm

Rate of heating up : .....°C/h

Time taken to reach required temperature : ..... h

Holding time : ..... h

Rate of cooling down : .....°C/

Method of cooling down : .....

Graphical presentation of the applic

heat treatment due to repairs etc. an additional sheet to be provided).

.....

.....

.....

anufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

NOZZLE ORIENTATION CHECK (sketch with dimensions)

Name and address of manufacturer : Section I, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Outline sketch (section and top view) or manufacturer's attachment.

...ons can be indicated between brackets on the as-built drawing, being part of this manufacturing report.

(-3) or 4000 (+5)
——————————> |

...facturer:	For inspection organization:
...ame:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

CIRCULARITY (out of roundness)

Name and address of manufacturer : Section J1, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Design: inside diameter, ID = mm
outside diameter, OD = mm
external circumference, C = mm
greatest permissible deviation from nomin

Section	D max.	Circularit Deviatio fro		+/- Deviation	Remarks
1					
2					
3					
4					
5					

of vessels to be installed in the vertical position, if the above measurements are made in the horizontal position, the measurements shall be repeated after turning the through 90° about its longitudinal axis.

anufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

STRAIGHTNESS

Name and address of manufacturer : Section J2, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

A wire shall be mounted at equal distances from the heads between the tan
Measurements shall not be made to a weld, fitting or other raised part.
The positive or negative deviations from 'L' to be stated.

Section	Deviations from str	
	LA +/-	LB +/-
1	.....	.....
2	.....	..
3	.....	
4	.....	
5		.....
6		.....
		.....
		.....
	.....	.....

.e shell from a straight line shall not exceed: ..... mm.

. of tubular heat exchangers the use of a 'pull through' is permitted and no values have then to be stated.

.cturer:	For inspection organization:
.e:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

PAINTING AND COATING SYSTEM

Name and address of manufacturer : Section K, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Painting/Coating system details :

Surface preparation as per code/standard No.:

Inspection of the surface finish has been carried out by the following method(s):

Results were considered: Satisfactory / Unsatisifactr

Layer Description /No.	Paint/coat name and specification reference	Minimum dry-film thickness (mm)		Curing* time in hours		Relative * hur
		Specified	Actual	Specified	Actu	

Adhesion/cohesion te ated to be successful.

Continuity p age spark test: Yes/No

The .....

.....

*uring time and interval period, relative humidity during application to be attached.

*ils of subsequent surface preparations should be noted.

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

PRESSURE TEST CERTIFICATE

Name and address of manufacturer : Section L, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

This is to certify that the above equipment has satisfactorily passed a pressure test under the conditions mentioned below:

1. Test pressure (outside tubes *) : ..... bar (ga) Holding time: .....

   Specification of medium:

   Type (water, air, etc.) : .....

   Temperature : .....°C

2.* Test pressure (inside tubes)* : ..... bar (ga) ... h

   Specification of medium:

   Type (water, air, etc.) : ....

   Temperature : .....°C

3. Maximum allowable differential pressure (she

4. Additional support (sketch) for

   If testing of column has ... uted in vertical situation (e.g. with regard to skirt).

5. Have ga...

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

EQUIPMENT NAMEPLATE OR STAMPING

Name and address of manufacturer : Section M, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Photograph or rubbing *

at does not apply

For manufacturer:	For inspection organization:
Name:	Name:
Position:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

ABRIDGED MANUFACTURING REPORT

Name and address of manufacturer : Section A1, sheet of

.....

Principal's purchase order No. : ..... Item No. : .....

Equipt. plant No. and name : .....

Manufacturer's production order No. : .....

Description of parts* : .....

.....

.....

Design code* : .....

Additional requirements : .....

Design pressure* : ..... bar (ga): Design te

Test pressure* : ..... bar (ga); Te

Overall dimensions : ..... mm

Weight of equipment (weight empty) : ..... kg

Drawing(s) No.(s) : .....

(Attach general arrangement draw

Manufacturer's serial No. : ..... : .....

Non-destructive testing* : .....

.....

Part of equi

construction materials

Actually used	Type of certificate	Certificate page No.

d (when applicable).

ve been designed, constructed and tested in every respect in accordance with the applicable code* and/o
oned in the purchase order.

.....

.....

d date: .....

Signature and stamp

For review:	For inspection organization:
Principal or nominee:	Name:
Name:	Position:
	Name of company:
Place and date:	Place and date:
Signature and stamp	Signature and stamp

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