

PETRONAS TECHNICAL STANDARDS

DESIGN AND ENGINEERING PRACTICE

TECHNICAL SPECIFICATION

L80 13% CR CASING AND TUBING (AMENDMENTS/ SUPPLEMENTS TO ISO 11960: 2004)

PTS 39.01.20.10

DECEMBER 2010



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This revision of PTS **39.01.20.10** - L80 13% CR CASING AND TUBING (AMENDMENTS/ SUPPLEMENTS TO ISO 11960:2004) has been updated to incorporate PETRONAS Lessons Learnt, Best Practice and new information issued by relevant industry code and standards. All updates in the document are highlighted in red font.

The previous version of this PTS **39.01.20.10 (October 1995)** will be removed from PTS binder / e-repository from herein onwards.

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PREFACE

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The objective is to set the recommended standard for good technical practice to be applied by PETRONAS' OPU in oil and gas production facilities, refineries, gas processing plants, chemical plants, marketing facilities or any other such facility, and thereby to achieve maximum technical and economic benefit from standardisation.

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PART I INTRODUCTION

1.1 SCOPE

This PTS defines the minimum technical requirements for the purchase of seamless grade L80 13%Cr casing, tubing, liners, pup-joints, connectors, and couplings. Part II of this PTS gives amendments and supplements to clauses of ISO 11960: 2004 (Dec 15, 2004).

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

Unless otherwise authorised by SIOP and SIEP, the distribution of this PTS is confined to companies forming part of the Royal Dutch/Shell Group or managed by a Group company, and to Contractors and Manufacturers/Suppliers nominated by them (i.e. the distribution code is "F", as described in PTS 39.01.20.10).

This PTS is intended for use in oil and gas production facilities.

If national and/or local regulations exist in which some of the requirements may be more stringent than in this PTS 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, environmental, economic and legal aspects. In all cases the Contractor shall inform the Principal of any deviation from the requirements of this PTS 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 PTS as closely as possible.

1.3 DEFINITIONS

1.3.1 General definitions

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

The **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, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

1.3.2 Specific definitions

Defect (in NDT) - a discontinuity or group of discontinuities whose indication(s) do not meet specified acceptance criteria.

Flaw/Discontinuity (in NDT) – an interruption which may be either intentional or unintentional, in the physical structure or configuration of a pipe.

Indication (in NDT) - evidence of a discontinuity that requires interpretation to determine its significance.

Premium Connection – a connection in which sealing is achieved by metal to metal contact between the two mating surfaces of the pin and box.

Purchaser - term used in ISO 11960: 2004 which has the same meaning as Principal.

1.4 ABBREVIATIONS

CLA	-	centre line average
CVN	-	Charpy vee notch
DN	-	diameter nominal
ECT	-	eddy current testing
EMI	-	electromagnetic inspection
FBH	-	flat bottomed hole
HB	-	Brinell hardness
ID	-	inside diameter
MFL	-	magnetic flux leakage
MPI	-	magnetic particle inspection
NDT	-	non-destructive testing
OCTG	-	oil country tubular goods
OD	-	outside diameter
RDH	-	radially drilled hole
S	-	seamless
UT	-	ultrasonic testing

1.5 CROSS-REFERENCES

Where cross-references to other parts of this PTS are made, the referenced section number is shown in brackets. Referenced section numbers of the ISO document are not shown in brackets.

1.6 GUIDANCE FOR USE

The amendments to ISO 11960: 2004 given in Part II are directly related to equivalent sections in ISO/DIS 11960.2. For clarity, the section and paragraph numbering of ISO 11960: 2004 has been used as far as possible. Where clauses in ISO 11960: 2004 are referenced within this PTS, it shall mean those clauses as amended by this PTS. Clauses in ISO 11960: 2004 that are not amended by this PTS shall remain valid as written.

PART II AMENDMENTS/SUPPLEMENTS TO ISO/DIS 11960.2

SECTION 1 SCOPE

1.1 Delete the first two paragraphs and replace with the following:

This specification covers seamless casing, tubing, liners, pup-joints, connectors, couplings and thread protection manufactured from Group 2, Grade L80 13%Cr martensitic stainless steel in the sizes shown in Annex A.

All pipes shall be supplied with premium connections specified by the Principal.

SECTION 2 NORMATIVE REFERENCES

Add the following to the list of normative references:

ASTM A 388	Practice for ultrasonic examination of heavy steel forgings
ASTM E 883	Standard guide for metallographic photomicrography
ISO 8501 Part 1	Preparation of steel substrates before application of paints and related products; visual assessment of surface cleanliness; Part 1: rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings
ISO 9001	Quality systems - Model for quality assurance in design, development, production, installation and servicing
ISO 9712	Non-destructive testing; qualification and certification of personnel
ISO 10474	Steel and steel products - Inspection documents
SEL 072	Ultrasonically tested heavy plate; technical delivery specifications

SECTION 6 PROCESS OF MANUFACTURE

6.1 GENERAL

Delete the first sentence of the second paragraph and replace it with the following:

Pipe furnished to this specification shall be produced by the seamless process, as shown in Table 1.

Billets used for seamless pipe shall be inspected visually, and shall be free from surface defects such as cracks, laps or seams which exceed 1 mm in depth th.

6.2 HEAT TREATMENT

6.2.1 General

Delete the second paragraph of this section and replace it with the following:

The furnaces shall be provided with suitable equipment to record the temperature-time relationship during continuous annealing or the heat treatment cycle in a batch type furnace.

6.2.2 Group 1

Delete this section.

6.2.3 Group 2

Delete this section and replace it with the following:

The Manufacturer shall demonstrate to the Principal that the tempering practice will result in the pipe attaining the minimum tempering temperature.

6.2.4 Groups 3 and 4

Delete this section.

6.3 STRAIGHTENING

6.3.1 Group 1, 3

Delete this section.

6.4 TRACEABILITY

6.4.1 General

Add to this section:

The Manufacturer, processor, threader and any other subcontractor shall apply a traceability system that meets the following requirements:

- unique lot identification numbers to provide direct and positive traceability to manufacturing and testing documentation;
- the lot number shall be marked on each pipe and coupling by low stress die stamping;
- the system shall provide for unique identification of any single component that in any way deviates from the acceptance standard of the lot, but is accepted by concession. The unique identification shall ensure that the history of deviant components remains uniquely traceable;
- the traceability system employed shall be documented, as required by Annex A, SR 15.2.

6.4.2 *Serialization of Grades C90, T95 and Q125*

Delete this section and its sub-sections.

SECTION 7 MATERIAL REQUIREMENTS

7.1 CHEMICAL REQUIREMENTS

Add to this section:

The composition of the pipe to be supplied shall be stated in the manufacturing procedure specification (*Section 13.6*) and, as determined by product analyses, shall comply with the maximum allowable limits specified in Table 2. The limitations on heat and product analyses shall be those agreed following acceptance of the manufacturing procedure specification; refer to Annex A, SR 15.

7.2 Tensile Properties

Insert below this heading:

All mechanical tests shall be performed on specimens taken from tubulars (unless otherwise stated) which have been subjected to all of the cold and hot working, and all of the heat treatment procedures which are performed on the finished product.

Samples removed for the determination of tensile properties shall be prepared by machining. If thermal cutting is used to remove pipe coupons from which test specimens are prepared, the full extent of the heat-affected region shall be removed during machining of the specimens.

7.3 Charpy V-notch - General requirements.

Delete the last sentence of the first paragraph and replace it with the following:

Only one of the tested impact specimens may exhibit an absorbed energy below that specified, and then the measured absorbed energy shall not be below 75% of that specified.

Full Charpy impact transition temperature curves shall be determined (longitudinal testing) of one completely finished pipe of each of the first two heats. The curves shall show impact energy (in Joules) and percentage shear (fibrous) of the fracture surface, plotted against temperature, over a temperature range sufficient to reproduce fracture appearance from 10% to 100% fibrous shear.

7.3.8 Statistical impact testing

Delete this section.

7.4 Charpy V-Notch; Absorbed energy requirements for coupling stock, coupling blanks, couplings

7.4.2 H40

Delete this section.

7.4.3 Grades J55 and K55 for API threads

Delete this section and Table 7.

7.4.5 Grades N80 Type 1 and N80Q, Groups 2 (except M65), 3 and 4 for API threads

Delete Tables 9, 10, 11 and 12.

7.5 Charpy V-notch; Absorbed energy requirements for pipe, Groups 1, 2 and 3.

Delete this section and replace it with the following:

The requirements of (Annex A, SR 16.2) shall apply.

7.6 Charpy V-notch; Absorbed energy requirements for casing, pup-joints and externally threaded connector material, Group 4

Delete this section and Tables 15 and 16.