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Petroleum and natural gas industries — Design and operation of subsea production systems —

Part 1:

General requirements and recommendations

AMENDMENT 2: Revised Annex L

rates standards Salues dan Les Industries du pétrole et du gaz naturel — Conception et exploitation des systèmes de production immergés —

Partie 1: Exigences générales et recommandations

AMENDEMENT 2: Révision de l'Annexe L

ICS 75.180.10

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Foreword

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Amendment 2 to ISO 136281-1:2005 was prepared by Technical Committee ISO/TC 67, Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries, Subcommittee SC 4, Drilling and production equipment.

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Petroleum and natural gas industries — Design and operation of subsea production systems —

Part 1: General requirements and recommendations

AMENDMENT 2: Revised Annex L

Page 1, Clause 2, add the following normative references

ISO 3183, Petroleum and natural gas industries — Steel pipe for pipelines — Technical delivery conditions Pipes of requirement class C

ISO 3834, Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements

ISO 9606, Approval testing of welders — Fusion welding

ISO 9712, Non-destructive testing — Qualification and certification of personnel

ISO 10423, Specification for wellhead and christmas tree equipment

ISO 10474, Metallic products — Types of inspection documents

ISO 15156, Petroleum and natural gas industries — Materials for use in H₂S-containing environments in oil and gas production

ISO 15590, Petroleum and natural gas industries - Part 1: Induction bends

ISO 15609, Specification and qualification of welding procedures for metallic materials — Welding procedure specification

ISO 15614-1, Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys

API 5L, Specification for line pipe

API 6A/ISO 10423, Specification for Wellhead and Christmas Tree Equipment

ASNT TC 1A, Recommended Practice, Personnel Qualification and Certification in Nondestructive Testing

ASTM A182, Forged and rolled alloy-steel pipe flanges, forged fittings and valves and parts for high temperature service

ASTM A 312, Seamless, Welded and Heavily Cold Worked Austenitic Stainless Steel Pipes

ASTM A 333, Seamless and Welded Steel Pipe for Low-Temperature Service

ASTM A 350, Carbon and Low-Alloyed Steel Forgings, Requiring Notch Toughness Testing for Piping Components

ASTM A 358, Electric-Fusion-Welded Austenitic Chromium-Nickel Alloy Steel Pipe for High Temperature Service and General Applications

ASTM A 388, Ultrasonic Examination of Heavy Steel Forgings

ASTM A 403, Wrought Austenitic Stainless Steel Piping Fittings

ASTM A 420, Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low Temperature Service

ASTM A 694, Carbon and Alloy Steel Forgings for Pipe Flanges, Fittings, Valves and Parts for High-Pressure Transmission Service

ASTM A 707, Forged Carbon and Alloy Steel Flanges For Low-Temperature Service

ASTM A 790, Seamless and Welded Ferritic/Austenitic Stainless Steel Pipe

ASTM A 815, Wrought Ferritic, Ferritic/Austenitic, and Martensitic Stainless Steel Piping Fittings

ASTM A 860, Wrought High-Strength Low-Alloy Steel Butt-Welding Fittings

ASTM A 928, Ferritic/Austenitic (Duplex) Stainless Steel Pipe Electric Fusion Welded With Addition of Filler Metal

ASTM A 988, Hot Isostatically-Pressed Stainless Steel Flanges, Fittings, Valves, and Parts for High-Temperature Service

ASTM B 366, Factory-Made Wrought Nickel and Nickel Alloy Fittings

ASTM B 564, Nickel Alloy Forgings

ell.al ASTM B 705, Nickel-Alloy (UNS N06625, N06219 and N08825) Welded Pipe

ASTM E 562, Determining Volume Fraction by Systematic Manual Point Count

ASTM G 48, Pitting and Crevice Corrosion Resistance of Stainless Steels and Related Alloys by Use of Ferric Chloride Solution

ASME II, Part C, BPVC SECTION II Materials

ASME V, BPVC SECTION V Nondestructive Examination

ASME IX, BPVC SECTION IX Welding and Brazing Qualifications

ASME VIII, Div. 1, Appendix 6 & 8: BPVC SECTION VIII Rules for Construction of Pressure Vessels Div. 1

EN 287-1, Qualification test of welders — Part 1. Steels

EN 473, Non-destructive testing — Qualification and certification of NDT personnel — General principles

EN 970, Non-destructive examination of fusion welds — Visual examination

EN 1418, Welding personnel approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials

EN 10204, Metallic products — Types of inspection documents

EN 10216-3, Seamless steel tubes for pressure purposes — Technical delivery conditions, Part 3: Non-alloy and alloy fine grain steel tubes

EN 10216-5, Seamless steel tubes for pressure purposes — Technical delivery conditions, Part 5: Stainless steel tubes

EN 10217-3, Welded steel tubes for pressure purposes — Technical delivery conditions, Part 3: Alloy fine arain steel tubes

EN 10217-7, Welded steel tubes for pressure purposes — Technical delivery conditions, Part 3: Stainless steel tubes

EN 10222-4, Steel forgings for pressure purposes - Part 4: Weldable fine-grain steels with high proof strength

EN 10222-5, Steel forgings for pressure purposes — Part 5: Martensitic, austenitic and austenitic-ferritic stainless steels

EN 10228-2, Non-destructive testing of steel forgings — Part 2: Penetrant testing

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EN 10228-3, Non-destructive testing of steel forgings — Part 3: Ultrasonic testing of ferritic or martensitic steel forgings

EN 10228-4, Non-destructive testing of steel forgings - Part 4: Ultrasonic testing of austenitic and austeniticferritic stainless steel forgings

DNV OS F-101, Submarine pipeline systems

Page 2, Clause 3, add the following Terms and definitions

carbon steel

generic term to designate the full range of carbon and carbon-manganese steels used in the construction of conventional oilfield equipment

corrosion resistant alloys (CRAs)

alloys that are intended to be resistant to general and localized corrosion in oilfield environments that are corrosive to carbon steels talog

low alloy steel

steels containing between 1 % and less than 5 % of elements deliberately added for the purpose of modifying properties

Page 3, 3.2, add the following Abbreviated terms

ASNT American Society of Non-destructive Testing

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DAC	distance	amplitude	curve	
			101	

FRH	flat	hottom	hole
	παι	DOLLOITI	IUIC

- FL fusion line
- HAZ heat affected zone
- LP liquid penetrant
- MDT minimum design temperature
- NA not applicable
- NDT non destructive testing
- parts per million (1/1 000 000) ppm
- **PWHT** post weld heat treatment
- SMYS specified minimum yield stress

ISO 13628-1:2005/CD Amd 2

- UT ultrasonic testing
- WM weld metal
- WPS welding procedure specification
- WPQR weld procedure qualification record
- Page 231, add the following Informative Annex

Annex L (informative)

Materials and welding of manifold piping and jumpers

L.1 General

This Annex L is informative; however users may, by agreement between the interested parties, consider the provisions to be either requirements or guidelines.

This informative Annex specifies the requirements and guidelines for subsea pressure-containing components and pipe assemblies for production of hydrocarbons and water/gas well-injection service, e.g. manifolds, jumpers and flow loops, fabricated in carbon, low-alloyed and stainless steels, and nickel based alloys. It includes all interfacing welds between manifolds and connecting components such as valves and connectors but excludes such items as valves, hubs, flexible pipes, control systems and support structures as templates covered by other standards.

It is based on using ASME B31.8 as the governing design code and gives additional requirements and guidelines to that code. For installation where a different design code from ASME B31.3 applies the requirement of that different code shall govern unless this is less stringent than required by this Annex.

There are no specified pressure limitations for the application of this Annex.

L.2 Material standards and testing requirements

L.2.1 General

All materials selections shall be in accordance with the requirements given in ISO 13628 Part 1 Amendment 1 Clause 6.

For valves and connectors designed to ISO 10423, the material requirements in that standard apply.

The pressure containing parts of the manifold structure should be formed from carbon, low alloyed, stainless steel or Nickel alloy as listed in L.2.2 and L.2.3 below.

A detailed material specification for each type of product shall be established. This specification shall clearly identify all manufacturing and testing requirements.

All components shall be delivered with a material certificate according to ISO 10474/EN 10204 Type 3.1 confirming all requirements of relevant component standard and additional requirements of this standard.

All materials for pipe, forgings and fittings shall be manufactured and used in accordance with the listed product specifications of the design standard and this standard. Use of other product standard has to be agreed and approved by the end user.

The requirements in the following clauses shall be in addition to or replace the corresponding requirements in the reference standards as relevant.

L.2.2 Pipe and pipe-fittings

The pipes and pipe-fittings shall either be manufactured by a seamless process hot working steel to form a tubular product without a welded seam, or longitudinal arc welded with process adding filler material.

Carbon and low alloy steel pipe and fittings shall conform to an appropriate reference standard suitable for the purpose of the application, e.g. Table L.1. The material grade should be limited upwards to 560 MPa minimum specified yield strength. The delivery condition of pipes may be in normalized, thermo-mechanically treated or quenched and tempered condition. All fittings shall be delivered in normalised, normalised and tempered, annealed or quenched and tempered condition. Welded pipes shall conform to the requirements of Clause L.6.

For welded pipes and fittings the PQR/WPQR shall be qualified in accordance with ASME IX or ISO 15614-1, and comply with the base material requirements. All welding shall be carried out by welders qualified in accordance with ISO 9606, ASME IX or EN 287.

Standard	Manufacturing process	Standard	Manufacturing process
API 5L PSL2	Seamless and welded	ASTM A 420	Seamless and welded fittings
DNV OS-F101	Seamless and welded	ASTM A 860	Seamless and welded fittings
ISO 3183	Seamless and welded	ASTM A 333	Seamless
EN 10216-3	Seamless	EN 10217-3	Welded
		Pl stell	45,200

Table L.1 — Reference standards for seamless and welded manifold pipe and pipe-fittings in carbon and low alloy steel

Stainless steel alloy pipe shall conform to an appropriate reference standard suitable for the purpose of the application, e.g. Table L.2.

Table L.2 — Reference standards for seamless and welded manifold pipe and pipe-fittings in stainless steel alloy

Standard	Manufacturing Process	Standard	Manufacturing Process
ASTM A 312	Seamless	EN 10216-5	Seamless
ASTM A 358	Welded http://www.	EN 10217-7	Welded
ASTM A 790	Seamless	ASTM A 403	Seamless and welded fittings
ASTM A 928	Welded	ASTM A 815	Seamless and welded fittings
ASTM B 705	Seamless and welded pipe	ASTM B 366	Seamless and welded fittings

The following stainless steels and nickel alloys, solid or clad, are applicable to manifold piping:

- type 316, 6 Mo and other high-alloyed stainless steel austenitic grades;
- type 22 or 25 Cr duplex;
- nickel based alloys, e.g. N06625 and N08825.

For clad pipe, the carbon steel pipe shall conform to an appropriate reference standard suitable for the purpose of the application, e.g. Table L.1.