ISO/FDIS 13680~~: 2023(E)~~

ISO/TC 67/SC 5~~/WG 3~~

Secretariat: JISC

Date: ~~2023-11-29~~2024-02-01

~~Petroleum~~Oil and ~~natural~~ gas industries including lower carbon energy — Corrosion-resistant alloy seamless products for use as casing, tubing, coupling stock and accessory material — Technical delivery conditions

~~*Industries du pétrole et du gaz naturel — Produits sans soudure en acier allié résistant à la corrosion utilisés comme tubes de cuvelage, tubes de production, tubes-ébauches pour manchons et matériau pour accessoires — Conditions techniques de livraison*~~

FDIS stage

Contents

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 67, *Oil and gas industries including lower carbon energy*, Subcommittee SC 5, *Casing, tubing and drill pipe*~~, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 12, *Oil and gas industries including lower carbon energy*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).~~.

This fifth edition cancels and replaces the fourth edition (ISO 13680:2020), which has been technically revised.

The main changes are as follows:

— adjustment of the scope and title to make it clear that bar material is now included (removal of the word "tubular");

— update of normative references;

— review of straightening requirements, including addition of Figure B.9;

— clarification on the use of alternative method for visual inspection;

— clarification of PMI requirements;

— clarification of marking content and sequence;

— extension of records retention period to five years;

— review of Annex H.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Users of this document should be aware that further or differing requirements can be needed for individual applications. This document is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This is particularly relevant to innovative or developing technology. Where an alternative is offered, it is the responsibility of the vendor to identify any variations from this document and provide details.

In this document, the following verbal forms are used:

a) "shall" indicates a requirement;

b) "should" indicates a recommendation;

c) "may" indicates a permission;

d) "can" indicates a possibility or a capability.

Information marked as "NOTE" is for guidance in understanding or clarifying the associated requirement. "Notes to entry" used in Clause 3 provide additional information that supplements the terminological data and can contain provisions relating to the use of a term.

Petroleum and natural gas industries

Oil and gas industries including lower carbon energy — Corrosion-resistant alloy seamless products for use as casing, tubing, coupling stock and accessory material — Technical delivery conditions

WARNING — It is the purchaser's responsibility to specify the product specification level (PSL), corrosion-resistant alloy (CRA) group, category, grade, delivery conditions and any other requirement in addition to those specified herewith to ensure that the product is adequate for the intended service environment. The ISO 15156 series or NACE MR0175 should be considered when making specific requirements for H_2S-containing environments; see Annex GAnnex G. It is the product user's responsibility to ensure that the product is suitable for the intended application with consideration of all environmental degradation threats during both normal operation and system upsets. There are other sources of hydrogen besides H_2S-containing environments, which are not addressed by the ISO 15156 series or NACE MR0175. Not all PSL-1 categories and grades can be made cracking resistant in accordance with the ISO 15156 series or NACE MR0175 and are, therefore, not included in PSL-2.

1 Scope

This document specifies the technical delivery conditions for corrosion-resistant alloy seamless products for casing, tubing, coupling stock and accessory material (including coupling stock and accessory material from bar) for two product specification levels:

— PSL-1, which is the basis of this document;

— PSL-2, which provides additional requirements for a product that is intended to be both corrosion and cracking resistant for the environments and qualification method specified in Annex GAnnex G and in the ISO 15156 series or NACE MR0175.

At the option of the manufacturer, PSL-2 products can be provided in lieu of PSL-1.

NOTE 1 The corrosion-resistant alloys included in this document are special alloys in accordance with ISO 4948-1 and ISO 4948-2.

NOTE 2 For the purpose of this document, NACE MR0175 is equivalent to the ISO 15156 series.

NOTE 3 Accessory products can be manufactured from coupling stock and tubular material, or from solid bar stock or from bored and heat heat-treated bar stock as covered in Annex F.

This document contains no provisions relating to the connection of individual lengths of pipe. Demonstration of conformance to ISO 15156-3:2020 or NACE MR0175-2021 of material affected by end sizing, connection manufacture or welding operations is outside the scope of this document.

This document contains provisions relating to marking of tubing and casing after threading.

This document is applicable to the following five groups of products:

a) a) group 1, which is composed of stainless alloys with a martensitic or martensitic/ferritic structure;

b) b) group 2, which is composed of stainless alloys with a ferritic-austenitic structure, such as duplex and super-duplex stainless alloy;

c) c) group 3, which is composed of stainless alloys with an austenitic structure (iron base);

d) d) group 4, which is composed of nickel-based alloys with an austenitic structure (nickel base);

e) e) group 5, which is composed of bar only (Annex F(Annex F)) in age-hardened (AH) nickel-based alloys with austenitic structure.

NOTE 4 Not all PSL-1 categories and grades can be made cracking resistant in accordance with the ISO 15156 series and are, therefore, not included in PSL-2.

2 Normative references

The following documents, as applicable for the product, are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 377, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing*

ISO 404, *Steel and steel products — General technical delivery requirements*

ISO 525, *Bonded abrasive products — General requirements*

ISO 643, *Steels– Micrographic determination of the apparent grain size*

ISO 3452--1, *Non-destructive testing — Penetrant testing — Part 1: General principles*

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 4885, *Ferrous materials — Heat treatments — Vocabulary*

ISO 4948--1, *Steels — Classification — Part 1: Classification of steels into unalloyed and alloy steels based on chemical composition*

ISO 4948--2, *Steels — Classification — Part 2: Classification of unalloyed and alloy steels according to main quality classes and main property or application characteristics*

ISO 6508--1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

ISO 6508--2, *Metallic materials — Rockwell hardness test — Part 2: Verification and calibration of testing machines and indenters*

ISO 6892--1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 6892--2, *Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature*

ISO 6929, *Steel products — Vocabulary*

ISO 8501--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 9712, *Non-destructive testing — Qualification and certification of NDT personnel*