Corrosion-resistant Alloy Seamless Products for Use as Casing, Tubing, Coupling Stock, and Accessory Material

API SPECIFICATION 5CRA
THIRD EDITION, APRIL 2025

API MONOGRAM PROGRAM EFFECTIVE DATE: OCTOBER 1, 2025

ISO 13680:2024 (Identical), 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

American Petroleum Institute

Special Notes

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed. The use of API publications is voluntary. In some cases, third parties or authorities having jurisdiction may choose to incorporate API standards by reference and may mandate compliance.

Neither API nor any of API's employees, subcontractors, consultants, committees, or other assignees make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. Neither API nor any of API's employees, subcontractors, consultants, or other assignees represent that use of this publication would not infringe upon privately owned rights.

API publications may be used by anyone desiring to do so. Every effort has been made by the Institute to assure the accuracy and reliability of the data contained in them; however, the Institute makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use or for the violation of any authorities having jurisdiction with which this publication may conflict.

API publications are published to facilitate the broad availability of proven, sound engineering and operating practices. These publications are not intended to obviate the need for applying sound engineering judgment regarding when and where these publications should be used. The formulation and publication of API publications is not intended in any way to inhibit anyone from using any other practices.

Any manufacturer marking equipment or materials in conformance with the marking requirements of an API standard is solely responsible for complying with all the applicable requirements of that standard. API does not represent, warrant, or guarantee that such products do in fact conform to the applicable API standard.

API Foreword

This American National Standard is under the jurisdiction of the API Subcommittee on Tubular Goods (SC 5). This standard is identical to the English version of ISO 13680:2024. ISO 13680:2024 was prepared by Technical Committee ISO/TC 67 (Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries), SC 5 (Casing, tubing and drill pipe).

In this American National Standard, the following editorial deviations have been made throughout the document:

— Change spelling of words common to the U.S. (e.g. color, not colour)

— Substitution of a decimal point for a decimal comma (e.g. 4.5, not 4,5)

— Substitution of a comma for a space in numbers ≥ 10,000 (e.g. 12,547, not 12 547)

— Removal of space(s) in numbers ≥ 1000 but < 10,000 (e.g. 5274, not 5 274)

— Removal of space(s) in numbers < 1 (e.g. 0.456987123, not 0.456 987 123)

— Addition of industry mark option in marking sequence (sections 11.3 and 11.4)

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

The verbal forms used to express the provisions in this document are as follows.

Shall: As used in a standard, “shall” denotes a minimum requirement to conform to the standard.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required to conform to the standard.

May: As used in a standard, “may” denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, “can” denotes a statement of possibility or capability.

This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the content of this publication or comments and questions concerning the procedures under which this publication was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the Director.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually by API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001, standards@api.org.

See Annex A of API Specification Q1 or the API website for information pertaining to the API Monogram Program and use of the API Monogram on applicable products or for information about the Monogram licensing program, please contact certification@api.org.

For API Monogram Program licensees and APIQR program registrants, this standard/addendum is effective on the program date printed on the cover but can be used voluntarily from the date of publication.

Also, for references listed in Section 2 that are undated, new editions may be used upon publication but become mandatory on the effective date specified by the publisher or 12 months from the publication date if an effective date is not specified.

ISO 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*.

This fifth edition (ISO 13680:2024) 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 PM 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.

Contents

Corrosion-resistant Alloy Seamless Products for Use as Casing, Tubing, Coupling Stock, and Accessory Material

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 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 G and in the ISO 15156 series or NACE MR0175.

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

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

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

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

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

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*