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**Petroleum and natural gas industries —  
Steel pipe for pipeline transportation  
systems**

*Industries du pétrole et du gaz naturel — Tubes en acier pour les  
systèmes de transport par conduites*



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## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3183 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 2, *Pipeline transportation systems*.

Working Group 16 of ISO/TC 67/SC 2 meets jointly with the Line Pipe Working Group (currently WG 4210) of the American Petroleum Institute (API) to ensure the harmonization of ISO 3183 with API Specification 5L.

This third edition of ISO 3183 cancels and replaces the second edition (ISO 3183:2007), on which it is based but with revisions to incorporate updating, clarification and additional technical requirements.

The second edition of ISO 3183 was harmonized to a great extent with the 44th edition of API 5L, published on 1 October 2007, and the revisions produced by the joint ISO and API Working Groups are intended to extend or complete harmonization with the new 45th edition of API 5L.

It is the intent of ISO/TC 67 that the second and third editions of ISO 3183 shall both be applicable, at the option of the purchaser (as defined in 4.49), for a period of six months from the first day of the calendar quarter immediately following the date of publication of this third edition, after which period, the second edition (ISO 3183:2007) will no longer be applicable.

## Introduction

This International Standard is the result of harmonizing the requirements of the following standards:

- API Spec 5L; 44th edition published 1 October 2007;
- ISO 3183:2007; second edition published 15 March 2007.

In the preparation of this third edition of ISO 3183, the technical committee has maintained the concept of two basic levels of standard technical requirements for line pipe expressed as two product specification levels (PSL 1 and PSL 2). Level PSL 1 provides a standard quality level for line pipe. Level PSL 2 has additional mandatory requirements for chemical composition, notch toughness and strength properties and additional non-destructive testing (NDT). Requirements that apply only to PSL 1 or only to PSL 2 are so designated. Requirements that are not designated to a specific PSL designation apply to both PSL 1 and PSL 2 pipe.

The technical committee also recognized that the petroleum and natural gas industry often specifies additional requirements for particular applications. In order to accommodate such needs, optional additional requirements for special applications are available, as follows:

- PSL 2 pipe ordered with a qualified manufacturing procedure (Annex B), the requirements of which have been enhanced to include verification detail of critical processes in the production of feedstock material, line pipe manufacture and product testing and inspection;
- PSL 2 pipe ordered with resistance to ductile fracture propagation in gas pipelines (Annex G);
- PSL 2 pipe ordered for sour service (Annex H);
- pipe ordered as “Through the Flowline” (TFL) pipe (Annex I);
- PSL 2 pipe ordered for offshore service (Annex J);

The following two new annexes are added to the third edition of this International Standard.

- PSL 2 pipe ordered for European onshore natural gas transmission pipelines (Annex M).
- Equations for threaded and coupled pipe and background equations for guided bend and CVN test (Annex P).

The requirements of the annex(es) apply only when specified on the purchase order.

When pipe is ordered for dual or multiple applications, the requirements of more than one annex for special applications can be invoked. In such instances, if a technical conflict arises due to applying the requirements of more than one annex for special applications, the most stringent requirement applicable to the intended service applies.

This International Standard does not provide guidance on when it is necessary to specify the above supplementary requirements. Instead, it is the responsibility of the purchaser to specify, based upon the intended use and design requirements, which, if any, of the supplementary requirements apply for a particular purchase order.

This third edition of ISO 3183 is the result of a continuing process of harmonizing documents of different heritage. It has been necessary to give consideration to traditional symbols (denoting mechanical or physical properties or their values, dimensions or test parameters) and the format of equations that have been widely used and which (in their traditional format) maintain strong links with other widely used standards and specifications, and with the original scientific work that led to their derivation. Accordingly, although in some instances changes to established symbols and equations have been made to optimize alignment with the ISO/IEC Directives, Part 2, in other instances, some symbols and equations, most specifically those in 9.2, Table F.1 and Annex P, have been retained in their traditional form to avoid causing confusion in this post-harmonization stage. Where changes have been made, care has been taken to ensure that the new symbol replacing the traditional one has been fully and clearly defined.

# Petroleum and natural gas industries — Steel pipe for pipeline transportation systems

## 1 Scope

This International Standard specifies requirements for the manufacture of two product specification levels (PSL 1 and PSL 2) of seamless and welded steel pipes for use in pipeline transportation systems in the petroleum and natural gas industries.

This International Standard is not applicable to cast pipe.

## 2 Conformance

### 2.1 Units of measurement

In this International Standard, data are expressed in both International System (SI) units and United States Customary (USC) units. For a specific order item, only one system of units shall be used, without combining data expressed in the other system. Data values expressed in SI and USC units shall not be combined on the same inspection document or in the same required pipe marking sequence.

Where product is tested and verified against requirements using one measurement system (USC or SI), and an inspection document is issued, with data reported in the alternate measurement system units, a statement shall appear on the inspection document indicating that the data presented was converted from the measurement system used for the original inspection.

The purchaser shall specify whether data, drawings, and maintenance dimensions of pipes shall be in the International System (SI) or US Customary (USC) system of measurements. Use of an SI data sheet indicates that the SI measurements shall be used. Use of a USC data sheet indicates that the USC system of measurements shall be used.

For data expressed in SI units, a comma is used as the decimal separator and a space is used as the thousands separator. For data expressed in USC units, a dot (on the line) is used as the decimal separator and a space is used as the thousands separator.

### 2.2 Rounding

Unless otherwise stated in this International Standard, to determine conformance with the specified requirements, observed or calculated values shall be rounded to the nearest unit in the last right-hand place of figures used in expressing the limiting value, in accordance with ISO 80000-1:2009, Annex B, Rule A.

NOTE For the purposes of this provision, the rounding method of ASTM E29-08<sup>[1]</sup> is equivalent to ISO 80000-1:2009, Annex B, Rule A.

### 2.3 Compliance to this International Standard

A documented quality system shall be applied to assist compliance with the requirements of this International Standard.

NOTE Documentation of a quality system does not require certification by a third party certification body. Only the creation or adoption of a written quality system is necessary to meet the requirement of this International Standard. ISO defers to the expertise of responsible quality management personnel to create or adopt the system which best reflects the need of each company. There are many existing quality management systems to which personnel can refer for guidance in the development of an appropriate quality system, including ISO/TS 29001<sup>[2]</sup> and API Spec Q1<sup>[3]</sup>, which contain provisions specific to the oil and gas industry, or ISO 9001<sup>[4]</sup>, which contains general requirements for quality management systems that are auditable. This list is not exhaustive and is provided for information only.