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Z245.1-18

Steel pipe

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In addition to the members of the Subcommittee on Materials, **Jan Andersson** made a valuable contribution to the development of this Standard.

Preface

This is the tenth edition of CSA Z245.1, *Steel pipe.* It supersedes the previous editions published in 2014, 2007 (reaffirmed 2012), 2007, 2002, 1998, 1995, 1993, 1990, 1986, and 1982.

The main changes introduced in this edition are the following:

a) the toughness requirements for ERW heat affected zone and weld area have been revised;
b) the macrohardness requirements for EW pipe have been revised;
c) new requirements for elevated temperature service, including steam distribution service, have been added;
d) the product analysis frequency requirements have been revised;
e) a new test pressure calculation formula has been added for pressure testing involving an end-sealing ram; and
f) the procedure for repair of defective welds by welding has been revised.

This Standard covers the requirements for steel pipe intended to be used for transporting fluids as specified in CAN/CSA-Z662, *Oil and gas pipeline systems.*

In this 2018 edition, where a major change or addition to the previous edition of this Standard has been made, the clause, table, or figure affected is identified by the symbol Ⓟ in the margin. Users of this Standard are advised that the change markers in the text are not intended to be all-inclusive and are provided as a convenience only; such markers cannot constitute a comprehensive guide to the revisions made to this Standard. Care must therefore be taken not to rely on the change markers to determine the current requirements of this Standard. As always, users of this Standard must consider the entire Standard.

This Standard was prepared by the Subcommittee on Materials, under the jurisdiction of the Technical Committee on Petroleum and Natural Gas Industry Pipeline Systems and Materials and the Strategic Steering Committee on Petroleum and Natural Gas Industry Systems, and has been formally approved by the Technical Committee.

Notes:

1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*
3) *This Standard was developed by consensus, which is defined by* CSA Policy governing standardization — Code of good practice for standardization *as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
4) *To submit a request for interpretation of this Standard, please send the following information to* ***inquiries@csagroup.org*** *and include "Request for interpretation" in the subject line:*
   a) *define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;*
   b) *provide an explanation of circumstances surrounding the actual field condition; and*
   c) *where possible, phrase the request in such a way that a specific "yes" or "no" answer will address the issue.*

   Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization *and are available on the* Current Standards Activities *page at* standardsactivities.csa.ca.
5) *This Standard is subject to review five years after date of publication, and suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to* ***inquiries@csagroup.org*** *and include "Proposal for change" in the subject line:*
   a) *Standard designation (number);*

b) *relevant clause, table, and/or figure number;*
c) *wording of the proposed change; and*
d) *rationale for the change.*

Z245.1-18
Steel pipe

1 Scope

1.1 General

This Standard covers seamless pipe, electric-welded pipe (flash-welded pipe and low-frequency electric-welded pipe excluded) and submerged-arc-welded pipe primarily intended for use in oil or gas pipeline systems.

Notes:

1) *Flash-welded pipe is pipe manufactured by a process using electric-resistance heating to produce a simultaneous coalescence over the entire area of the abutting edges and the application of pressure for joining.*
2) *Low frequency is less than 1 kHz.*

1.2 Outside diameter, grade, and category

Note: *It is not intended that pipe be available in all combinations of size, grade, category, and manufacturing process. The individual pipe manufacturers should be consulted to ascertain the availability of specific pipe items.*

1.2.1 Outside diameter

This Standard covers pipe having specified outside diameters from 21.3 to 2032 mm. The standard outside diameters are given in Table B.1.

1.2.2 Grade

For other than sour service, this Standard covers pipe from Grade 241 to Grade 825. For sour service, this Standard covers pipe from Grade 241 to Grade 483.

Note: *The standard grades are Grades 241, 290, 359, 386, 414, 448, 483, 550, 620, 690, and 825; however, intermediate grades may also be used.*

1.2.3 Category

This Standard covers pipe in the following categories:

a) Category I: pipe without requirements for proven pipe body notch-toughness properties;
b) Category II: pipe with requirements for proven pipe body notch-toughness properties in the form of energy absorption and fracture appearance; and
c) Category III: pipe with requirements for proven pipe body notch-toughness properties in the form of energy absorption.

1.3 Terminology

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

Ⓟ 2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the editions listed below, unless the user finds it more appropriate to use newer or amended editions of such publications. Some reference publications are supplemented, qualified, or both by specific requirements elsewhere in this Standard; reference publications should therefore be applied only in the context of this Standard.

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CAN/CSA-Z662-15
Oil and gas pipeline systems

API (American Petroleum Institute)

RP 5L3 (2014)
Drop-Weight Tear Tests on Line Pipe

ASME International (American Society of Mechanical Engineers)

Boiler and Pressure Vessel Code, 2017
Section IX — Welding and Brazing Qualifications

B1.20.1-2013
Pipe Threads, General Purpose, Inch

ASNT (American Society for Nondestructive Testing)

SNT-TC-1A (2016)
Recommended Practice: Personnel Qualification and Certification in Nondestructive Testing

ASTM International (American Society for Testing and Materials)

A370-17
Standard Test Methods and Definitions for Mechanical Testing of Steel Products

A751-14a
Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

E18-17e1
Standard Test Methods for Rockwell Hardness of Metallic Materials

E21-09
Standard Test Methods for Elevated Tension Tests of Metallic Materials

E29-13
Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

