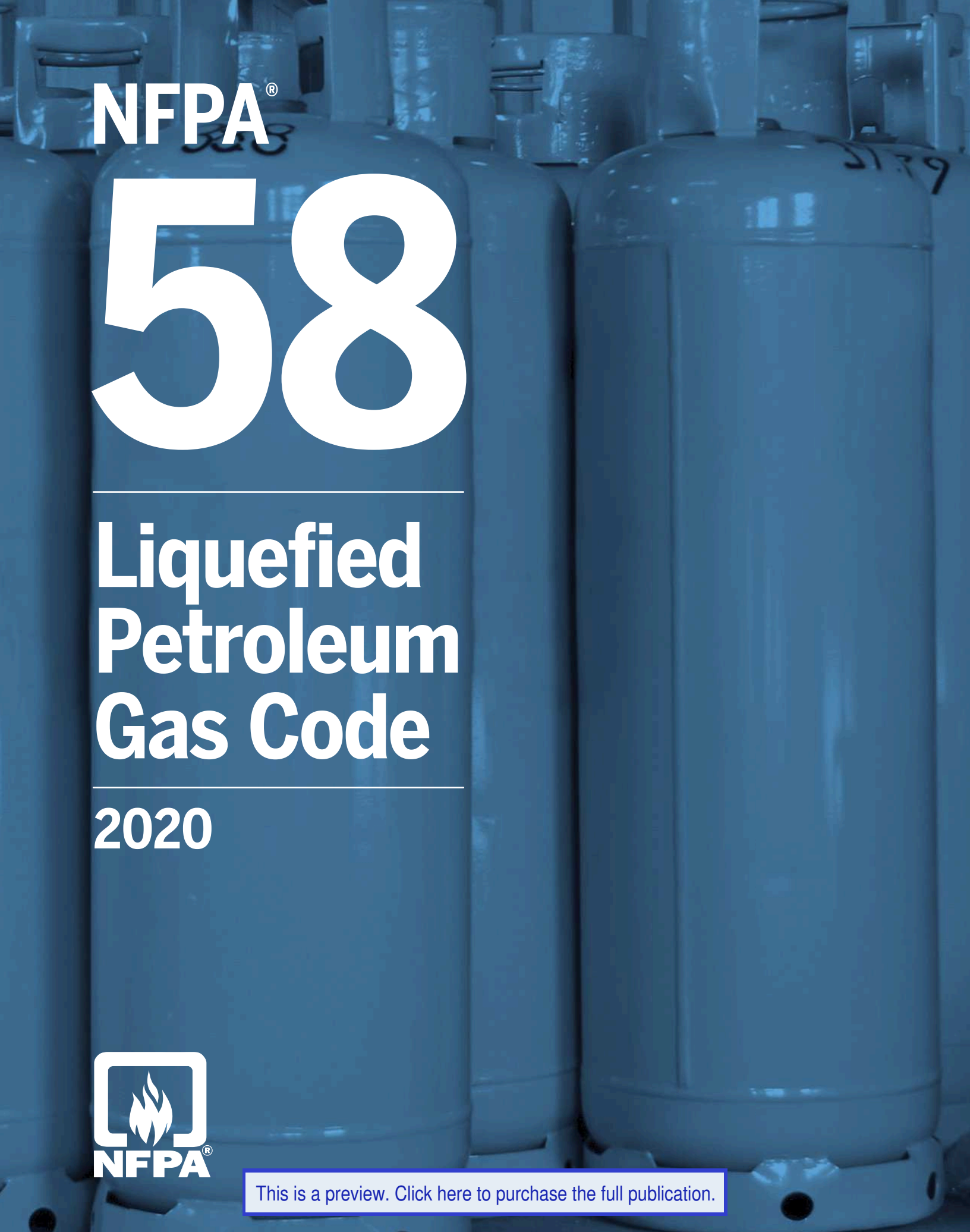

NFPA®

58

Liquefied Petroleum Gas Code

2020

NFPA®

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NFPA® 58

Liquefied Petroleum Gas Code

2020 Edition

This edition of NFPA 58, *Liquefied Petroleum Gas Code*, was prepared by the Technical Committee on Liquefied Petroleum Gases and acted on by NFPA at its Association Technical Meeting held June 17–20, 2019, in San Antonio, TX. It was issued by the Standards Council on August 5, 2019, with an effective date of August 25, 2019, and supersedes all previous editions.

This document has been amended by one or more Tentative Interim Amendments (TIAs) and/or Errata. See "Codes & Standards" at www.nfpa.org for more information.

This edition of NFPA 58 was approved as an American National Standard on August 25, 2019.

Origin and Development of NFPA 58

The first NFPA standard on LP-Gas was adopted in 1932. In 1940, several standards were combined and adopted as NFPA 58.

Revisions of NFPA 58 were adopted in 1934, 1937, 1939, 1940, 1943, 1946, 1948, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1965, 1967, 1969, 1972, 1974, 1976, 1979, 1983, 1986, 1989, 1992, 1995, 1998, 2001, 2004, 2008, 2011, 2014, 2017, and the latest one, in 2020.

The 2011 edition of NFPA 58 included several significant changes. The installation of underground LP-Gas storage containers required cathodic protection systems, and the systems were required to be monitored to verify that they were protected. The requirement that a pressure relief valve be piped vertically upward 7 ft (2.1 m) from the valve was deleted because the technical committee could find no technical reason to justify it. Former railroad tank cars were no longer allowed to be installed as permanent storage containers because they were not constructed to the ASME *Boiler and Pressure Vessel Code*, and additional recommendations for training were added to Annex A.

The 2014 edition harmonized container requirements for containers with equal to or less than 4000 gal water capacity (w.c.) (15.2 m^3) and greater than 4000 gal w.c. (15.2 m^3). Bulk plants and industrial plants are defined as facilities that store more than 4000 gal w.c. (15.2 m^3), which is the reason for the demarcation point of 4000 gal w.c. (15.2 m^3). A new definition was added for *vehicular barrier protection (VBP)*. There were many installations where the container and valves were required to be protected from vehicular impact, but no specific information was available as to what constituted such protection. In addition to the definition describing VBP, extensive annex material was incorporated. Prescriptive requirements also were added for VBP of LP-Gas dispensers.

Qualifications of personnel were expanded for clarification in Chapter 4 of the 2014 edition. The requirements, which originated as a Temporary Interim Amendment (TIA) to the 2011 edition, specified which personnel and in which topics they must be trained. New requirements included the covering of tank heaters, and requirements for vaporizers were updated.

The 2014 edition included new requirements to provide cathodic protection for underground metallic piping systems greater than 2 in. (5.08 cm) diameter. Previously, all underground metallic piping was only required to be coated or painted. The new requirements for piping systems were very similar to those for cathodic protection of underground containers.

In previous editions, hot air balloons were not covered under the scope of NFPA 58. The 2017 edition added requirements referencing the current state of federal law regarding their use and construction. The requirements for hot air balloons were included in the corresponding sections for scope, construction, and liquid transfer. The requirements for when a container or piping must be protected from snow loads were altered to allow for calculations and snowfall maps from ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*. The threshold for protecting containers and appurtenances from snow was raised to 100 lb/ft^2 (488 kgf/m^2). Vehicle barrier protection

(VBP) for cylinders protected in a metal cabinet was removed. The VBP requirement for 12,000 lb (53,375 N) protection for vehicle fuel dispensers was also removed.

A new Chapter 12 in the 2017 edition updated the technology available for over-the-road vehicles utilizing LP-Gas. New definitions, construction, transportation, and location requirements were added for skid tanks and porta-pacs. Also, requirements were added in Chapter 6 for the placing of ASME tanks that have been disconnected from use.

Fire extinguisher requirements were centralized to Section 4.7 for basic requirements in the 2017 edition, with individual capacity requirements remaining in the specific application section. The appurtenance requirements in Table 5.9.4.1(B) were expanded to cover containers, except DOT Spec. 39, less than 2 lb (0.9 kg) propane capacity. Universal tanks were permitted to be filled in the horizontal or vertical orientation as long as the positioning slot was in the correct orientation.

In the 2020 edition, new requirements for fire resistance rating and noncombustible materials have been added to specify when materials are required to have a certain fire resistance rating or when they must be noncombustible. Schedule 10 steel piping has been allowed for use in aboveground vapor service only and austenitic stainless steel has been allowed as a piping material.

Fire extinguisher requirements have been revised to specify that fire extinguishers shall not be used for LP-Gas pressure fires unless the source of fuel can be shut off promptly, a revision that removes conflict between industry standards and this code when choosing a fire extinguisher for an application.

Requirements have been added to require inspection of the face seal on CGA 791 and CGA 793 connections prior to filling because defects in the connection face seal will degrade the effectiveness of the seal; if any defects are found on the face seal, the cylinder is not to be refilled and the valve is to be replaced.

Purging of piping within the scope of NFPA 58 has been revised in the 2020 edition to direct the user to the purging procedures of NFPA 54, regardless of the system's operating pressure. In previous editions, NFPA 56 had been referenced for purging procedures; however, LP-Gas systems under the scope of NFPA 58 are excluded from consideration in NFPA 56. While NFPA 54's scope only covers LP-gas systems up to 125 psig (0.86 MPag), the purging procedures in NFPA 54 are also appropriate for NFPA 58 applications.

Revisions were made to Chapter 15, Operations and Maintenance, to specifically reference operations and maintenance requirements and to remove a number of unrelated installation requirements. Additionally, the scope of Chapter 15 has been revised to exclude systems regulated by the U.S. Department of Transportation because its requirements for operations and maintenance are more stringent.

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Committee Scope: This Committee shall have primary responsibility for documents on the design, construction, installation, and operation of fixed and portable liquefied petroleum gas systems in bulk plants and commercial, industrial (with specified exceptions), institutional, and similar properties; truck transportation of liquefied petroleum gas; engine fuel systems on motor vehicles and other mobile equipment; storage of containers awaiting use or resale; installation on commercial vehicles; and liquefied petroleum gas service stations.

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Liquefied Petroleum Gas Code

2020 Edition

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another NFPA document. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced and extracted publications can be found in Chapter 2 and Annex N.

Chapter 1 Administration

1.1* Scope. This code shall apply to the storage, handling, transportation, and use of liquefied petroleum gas (LP-Gas).

1.2 Purpose. (Reserved)

1.3 Application.

1.3.1 Application of Code. This code shall apply to the operation of all LP-Gas systems, including the following:

(1) Containers, piping, and associated equipment, when delivering LP-Gas to a building for use as a fuel gas.
(2) Highway transportation of LP-Gas.
(3) The design, construction, installation, and operation of marine terminals whose primary purpose is the receipt of LP-Gas for delivery to transporters, distributors, or users, except for marine terminals associated with refineries, petrochemicals, gas plants, and marine terminals whose purpose is the delivery of LP-Gas to marine vessels.
(4)* The design, construction, installation, and operation of pipeline terminals that receive LP-Gas from pipelines under the jurisdiction of the U.S. Department of Transportation (DOT) whose primary purpose is the receipt of LP-Gas for delivery to transporters, distributors, or users. Coverage shall begin downstream of the last pipeline valve or tank manifold inlet.

Δ **1.3.2 Nonapplication of Code.** This code shall not apply to the following:

(1) Frozen ground containers and underground storage in caverns, including associated piping and appurtenances used for the storage of LP-Gas
(2) Natural gas processing plants, refineries, and petrochemical plants
(3) LP-Gas at utility gas plants (including refrigerated storage) *(see NFPA 59)*
(4)* Chemical plants where specific approval of construction and installation plans is obtained from the authority having jurisdiction
(5)* LP-Gas used with oxygen
(6)* The portions of LP-Gas systems covered by NFPA 54 where NFPA 54 is adopted, used, or enforced
(7) Transportation by air, rail, or water under the jurisdiction of the DOT
(8)* Marine fire protection
(9) Refrigeration cycle equipment and LP-Gas used as a refrigerant in a closed cycle
(10) The manufacturing requirements for recreational vehicle LP-Gas systems that are addressed by NFPA 1192
(11) Propane vehicle fuel dispensers located at multiple fuel refueling stations *(see NFPA 30A)*

1.4 Retroactivity. The provisions of this code reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this code at the time it was issued.

1.4.1 Unless otherwise specified, the provisions of this code shall not apply to facilities, equipment, appliances, structures, or installations that existed or were approved for construction or installation prior to the effective date of the code. Equipment and appliances include stocks in manufacturers' storage, distribution warehouses, and dealers' storage and showrooms in compliance with the provisions of this code in effect at the time of manufacture. Where specified, the provisions of this code shall be retroactive.

1.4.2 In those cases where the authority having jurisdiction determines that the existing situation presents a distinct hazard to life and property, the authority having jurisdiction shall be permitted to apply any portions of this code retroactively.

1.4.3 Where the application of the retroactivity requirements of this code are determined to be impractical in the judgment of the authority having jurisdiction, alternate requirements that provide a reasonable degree of safety shall be provided by the authority having jurisdiction.

1.5 Equivalency. Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code.

1.5.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

Δ **1.6 Units and Formulas.** The primary units of measure used in this code shall be U.S. customary units (inch-pound units).

N 1.6.1 International System (SI) units shall follow inch-pound units in parenthesis.

N 1.6.2 SI equivalents in this code are approximate and shall not be used to lessen any provision.

1.7 Enforcement. This code shall be administered and enforced by the authority having jurisdiction designated by the governing authority. *(See Annex J for sample wording for enabling legislation.)*

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this code and shall be considered part of the requirements of this document.

Δ 2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2018 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2019 edition.

NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection,* 2017 edition.

NFPA 30, *Flammable and Combustible Liquids Code,* 2018 edition.

NFPA 30A, *Code for Motor Fuel Dispensing Facilities and Repair Garages,* 2018 edition.

NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work,* 2019 edition.

NFPA 54, *National Fuel Gas Code,* 2018 edition.

NFPA 55, *Compressed Gases and Cryogenic Fluids Code,* 2020 edition.

NFPA 59, *Utility LP-Gas Plant Code,* 2018 edition.

NFPA 70®, National Electrical Code®, 2020 edition.

NFPA 99, *Health Care Facilities Code,* 2018 edition.

NFPA *101®, Life Safety Code®,* 2018 edition.

NFPA 160, *Standard for the Use of Flame Effects Before an Audience,* 2016 edition.

NFPA 220, *Standard on Types of Building Construction,* 2018 edition.

NFPA 1192, *Standard on Recreational Vehicles,* 2018 edition.

2.3 Other Publications.

Δ 2.3.1 API Publications. American Petroleum Institute, 1220 L Street, NW, Washington, DC 20005-4070.

API-ASME *Code for Unfired Pressure Vessels for Petroleum Liquids and Gases,* Pre-July 1, 1961.

API 607, *Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats,* 2016.

API 620, *Design and Construction of Large, Welded, Low-pressure Storage Tanks,* 2008 with 2009, 2010, 2012, and 2013 Addenda.

2.3.2 ASCE Publications. American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400.

ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures,* 2016.

2.3.3 ASME Publications. American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990.

ASME B1.20.1, *Pipe Threads, General Purpose, Inch,* 2013.

ASME B16.40, *Manually Operated Thermoplastic Gas Shutoffs and Valves in Gas Distribution Systems,* 2013.

ASME B31.3, *Process Piping,* 2014.

ASME B36.10M, *Welded and Seamless Wrought Steel Pipe,* 2015.

Boiler and Pressure Vessel Code, 2013.

2.3.4 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM A47/A47M, *Standard Specification for Ferritic Malleable Iron Castings,* 1999, reapproved 2014.

ASTM A48/A48M, *Standard Specification for Gray Iron Castings,* 2003, reapproved 2016.

ASTM A53/A53M, *Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless,* 2018.

ASTM A106/A106M, *Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service,* 2018.

ASTM A213/A213M, *Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes,* 2018a.

ASTM A249/A249M, *Standard Specification for Welded Austenitic Steel Boiler, Superheater, Heat-Exchanger, and Condenser Tubes,* 2018.

ASTM A269/A269M, *Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service,* 2015a.

ASTM A312/A312M, *Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes,* 2018.

ASTM A395/A395M, *Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures,* 1999, reapproved 2014.

ASTM A513/A513M, *Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing,* 2018.

ASTM A536, *Standard Specification for Ductile Iron Castings,* 1984, reapproved 2014.

ASTM B42, *Standard Specification for Seamless Copper Pipe, Standard Sizes,* 2015a.

ASTM B43, *Standard Specification for Seamless Red Brass Pipe, Standard Sizes,* 2015.

ASTM B75/B75M, *Standard Specification for Seamless Copper Tube,* 2011.

ASTM B86, *Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings,* 2013.

ASTM B88, *Standard Specification for Seamless Copper Water Tube,* 2016.

ASTM B135/B135M, *Standard Specification for Seamless Brass Tube,* 2017.

ASTM B280, *Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service,* 2018.

ASTM D2513, *Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings,* 2018a.