



Designation: A790/A790M – 24

Standard Specification for Seamless and Welded Ferritic/Austenitic Stainless Steel Pipe¹

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1. Scope*

1.1 This specification² covers seamless and straight-seam welded ferritic/austenitic steel pipe intended for general corrosive service, with particular emphasis on resistance to stress corrosion cracking. These steels are susceptible to embrittlement if used for prolonged periods at elevated temperatures.

1.2 Optional supplementary requirements are provided for pipe when a greater degree of testing is desired. These supplementary requirements call for additional tests to be made and, when desired, one or more of these may be specified in the order.

1.3 **Appendix X1** of this specification lists the dimensions of welded and seamless stainless steel pipe as shown in ANSI B36.19. Pipe having other dimensions may be furnished provided such pipe complies with all other requirements of this specification.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard. The inch-pound units shall apply unless the *M* designation of this specification is specified in the order.

NOTE 1—The dimensionless designator NPS (nominal pipe size) has been substituted in this standard for such traditional terms as nominal diameter, size, and nominal size.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.10 on Stainless and Alloy Steel Tubular Products.

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² For ASME Boiler and Pressure Vessel Code applications see related Specification SA-790 in Section II of that Code.

2. Referenced Documents

2.1 ASTM Standards:³

- A370 Test Methods and Definitions for Mechanical Testing of Steel Products
- A923 Test Methods for Detecting Detrimental Intermetallic Phase in Duplex Austenitic/Ferritic Stainless Steels
- A941 Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroalloys
- A999/A999M Specification for General Requirements for Alloy and Stainless Steel Pipe
- E213 Practice for Ultrasonic Testing of Metal Pipe and Tubing
- E309 Practice for Eddy Current Examination of Steel Tubular Products Using Magnetic Saturation
- E381 Method of Macroetch Testing Steel Bars, Billets, Blooms, and Forgings
- E426 Practice for Electromagnetic (Eddy Current) Examination of Seamless and Welded Tubular Products, Titanium, Austenitic Stainless Steel and Similar Alloys
- E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

2.2 ANSI Standards:⁴

- B1.20.1 Pipe Threads, General Purpose
- B36.10 Welded and Seamless Wrought Steel Pipe
- B36.19 Stainless Steel Pipe

2.3 SAE Standard:⁵

- SAE J 1086

2.4 Other Standard:⁶

- SNT-TC-1A Personal Qualification and Certification in Nondestructive Testing

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁵ Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.

⁶ Available from American Society for Nondestructive Testing (ASNT), P.O. Box 28518, 1711 Arlingate Ln., Columbus, OH 43228-0518, <http://www.asnt.org>.

*A Summary of Changes section appears at the end of this standard



TABLE 1 Heat Treatment

UNS Designation	Type ^A	Temperature °F [°C]	Quench
S31200		1920–2010 [1050–1100]	Rapid cooling in water
S31260		1870–2010 [1020–1100]	Rapid cooling in water or by other means
S31500		1800–1900 [980–1040]	Rapid cooling in water or by other means
S31803		1870–2010 [1020–1100]	Rapid cooling in water or by other means
S32003		1850–2050 [1010–1120]	Rapid cooling in water or by other means
S32101		1870 [1020]	Rapid cooling in water or by other means
S32202		1870–1975 [1020–1080]	Rapid cooling in water or by other means
S32205	2205	1870–2010 [1020–1100]	Rapid cooling in water or by other means
S32304	2304	1700–1920 [925–1050]	Rapid cooling in water or by other means
S32506		1870–2050 [1020–1120]	Rapid cooling in water or by other means
S32520		1975–2050 [1080–1120]	Rapid cooling in water or by other means
S32550	255	1900 [1040] min	Rapid cooling in water or by other means
S32707		1975–2050 [1080–1120]	Rapid cooling in water or by other means
S32750	2507	1880–2060 [1025–1125]	Rapid cooling in water or by other means
S32760		1960–2085 [1070–1140]	Rapid cooling in water or by other means
S32808		1920–2100 [1050–1150]	Rapid cooling in water or by other means
S32900	329	1700–1750 [925–955]	Rapid cooling in water or by other means
S32906		1870–2100 [1020–1150]	Rapid cooling in water or by other means
S32950		1820–1880 [990–1025]	Air cool
S33207		1905–2085 [1040–1140]	Rapid cooling in water or by other means
S39274		1920–2060 [1050–1125]	Rapid cooling in water or by other means
S39277		1975–2155 [1080–1180]	Rapid cooling in water or by other means
S81921		1760–2010 [960–1100]	Rapid cooling in water or by other means
S82011		1850–2050 [1010–1120]	Rapid cooling in water or by other means
S82121		1830–2010 [1000–1100]	Rapid cooling in water or by other means
S82441		1870 [1020]	Rapid cooling in water or by other means
S83071	...	1830–2100 [1000–1150]	Rapid cooling in water or by other means
S83072	...	1830–2100 [1000–1150]	Rapid cooling in water or by other means

^A Common name, not a trademark, widely used, not associated with any one producer. 329 is an AISI number.

2.5 AWS Standard:⁷

A5.9 Corrosion-Resisting Chromium and Chromium-Nickel Steel Welding Rods and Electrodes

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification refer to Terminology A941.

⁷ Available from American Welding Society (AWS), 550 NW LeJeune Rd., Miami, FL 33126, <http://www.aws.org>.

4. Ordering Information

4.1 Orders for material under this specification should include the following, as required, to describe the desired material adequately:

4.1.1 Quantity (feet, [metres], or number of lengths),

4.1.2 Name of material (ferritic/austenitic steel pipe),

4.1.3 Process (seamless or welded),

4.1.4 Grade (see Table 1),

4.1.5 Size (NPS designator or outside diameter and schedule number of average wall thickness),