



Designation: A813/A813M – 24

Standard Specification for Single- or Double-Welded Austenitic Stainless Steel Pipe¹

This standard is issued under the fixed designation A813/A813M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This specification covers two classes of fit-up and alignment quality straight-seam single- or double-welded austenitic steel pipe intended for high-temperature and general corrosive service.

NOTE 1—When the impact test criterion for a low-temperature service would be 15 ft-lbf [20 J] energy absorption or 15 mils [0.38 mm] lateral expansion, some of the austenitic stainless steel grades covered by this specification are accepted by certain pressure vessel or piping codes without the necessity of making the actual test. For example, Grades 304, 304L, and 347 are accepted by the ASME Pressure Vessel Code, Section VIII Division 1, and by the Chemical Plant and Refinery Piping Code, ANSI B31.3 for service at temperatures as low as -425°F [-250°C] without qualification by impact tests. Other AISI stainless steel grades are usually accepted for service temperatures as low as -325°F [-200°C] without impact testing. Impact testing may, under certain circumstances, be required. For example, materials with chromium or nickel content outside the AISI ranges, and for material with carbon content exceeding 0.10 %, are required to be impact tested under the rules of ASME Section VIII Division 1 when service temperatures are lower than -50°F [-45°C].

1.2 Grades TP304H, TP304N, TP316H, TP316N, TP321H, TP347H, and TP348H are modifications of Grades TP304, TP316, TP321, TP347, and TP348, and are intended for high-temperature service.

1.3 Two classes of pipe are covered as follows:

1.3.1 *Class SW*—Pipe, single-welded with no addition of filler metal and

1.3.2 *Class DW*—Pipe, double-welded with no addition of filler metal.

1.4 Optional supplementary requirements are provided for pipe where 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.

1.5 **Table 1** lists the dimensions of welded 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 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.

Current edition approved March 1, 2024. Published April 2024. Originally approved in 1983. Last previous edition approved in 2019 as A813/A813M – 14 (2019). DOI: 10.1520/A0813_A0813M-24.

1.6 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.

1.7 *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.*

2. Referenced Documents

2.1 ASTM Standards:²

A262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

A480/A480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

A751 Test Methods and Practices for Chemical Analysis of Steel Products

A999/A999M Specification for General Requirements for Alloy and Stainless Steel Pipe

E213 Practice for Ultrasonic Testing of Metal Pipe and Tubing

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 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.

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

**TABLE 1 Dimensions of Welded and Seamless Stainless Steel Pipe^A**

NOTE 1—Table 1 is based on Table number 1 of the American National Standard for Stainless Steel Pipe (ANSI B36.19-1965).

NOTE 2—The decimal thickness listed for the respective pipe sizes represents their nominal or average wall dimensions.

NPS Designator	Outside Diameter		Nominal Wall Thickness							
	in.	mm	Schedule 5S ^B		Schedule 10S ^B		Schedule 40S		Schedule 80S	
			in.	mm	in.	mm	in.	mm	in.	mm
1/8	0.405	10.29	...	...	0.049 ^C	1.24	0.068	1.73	0.095	2.41
1/4	0.540	13.72	...	...	0.065 ^C	1.65	0.088	2.24	0.119	3.02
3/8	0.675	17.15	...	...	0.065 ^C	1.65	0.091	2.31	0.126	3.20
1/2	0.840	21.34	0.065 ^C	1.65	0.083 ^C	2.11	0.109	2.77	0.147	3.73
3/4	1.050	26.67	0.065 ^C	1.65	0.083 ^C	2.11	0.113	2.87	0.154	3.91
1.0	1.315	33.40	0.065 ^C	1.65	0.109 ^C	2.77	0.133	3.38	0.179	4.55
1 1/4	1.660	42.16	0.065 ^C	1.65	0.109 ^C	2.77	0.140	3.56	0.191	4.85
1 1/2	1.900	48.26	0.065 ^C	1.65	0.109 ^C	2.77	0.145	3.68	0.200	5.08
2	2.375	60.33	0.065 ^C	1.65	0.109 ^C	2.77	0.154	3.91	0.218	5.54
2 1/2	2.875	73.03	0.083	2.11	0.120 ^C	3.05	0.203	5.16	0.276	7.01
3	3.500	88.90	0.083	2.11	0.120 ^C	3.05	0.216	5.49	0.300	7.62
3 1/2	4.000	101.60	0.083	2.11	0.120 ^C	3.05	0.226	5.74	0.318	8.08
4	4.500	114.30	0.083	2.11	0.120 ^C	3.05	0.237	6.02	0.337	8.56
5	5.563	141.30	0.109 ^C	2.77	0.134 ^C	3.40	0.258	6.55	0.375	9.52
6	6.625	168.28	0.109	2.77	0.134 ^C	3.40	0.280	7.11	0.432	10.97
8	8.625	219.08	0.109 ^C	2.77	0.148 ^C	3.76	0.322	8.18	0.500	12.70
10	10.750	273.05	0.134 ^C	3.40	0.165 ^C	4.19	0.365	9.27	0.500 ^C	12.70 ^C
12	12.750	323.85	0.156 ^C	3.96	0.180 ^C	4.57	0.375 ^C	9.52 ^C	0.500 ^C	12.70 ^C
14	14.000	355.60	0.156 ^C	3.96	0.188	4.78	...	...	...	...
16	16.000	406.40	0.165 ^C	4.19	0.188	4.78	...	...	...	...
18	18.000	457.20	0.165 ^C	4.19	0.188	4.78	...	...	...	...
20	20.000	508.00	0.188 ^C	4.78	0.218 ^C	5.54	...	...	...	...
22	22.000	558.80	0.188 ^C	4.78	0.218 ^C	5.54	...	...	...	...
24	24.000	609.60	0.218 ^C	5.54	0.250	6.35	...	...	...	...
30	30.000	762.00	0.250	6.35	0.312	7.92	...	...	...	...

^AFor pipe sizes not listed, the dimensions and tolerances shall be by agreement between the purchaser and producer.

^BSchedules 5S and 10S wall thicknesses do not permit threading in accordance with the American National Standard for Pipe Threads (ANSI B1.20.1).

^CThese do not conform to the American National Standard for Welded and Seamless Wrought Steel Pipe (ANSI B36.10-1979).

2.2 ANSI Standards:³

B1.20.1 Pipe Threads, General Purpose

B31.3 Chemical Plant and Refinery Piping Code

B36.10 Welded and Seamless Wrought Steel Pipe

B36.19 Stainless Steel Pipe

2.3 ASME Boiler and Pressure Vessel Code:

Section VIII Division 1, Pressure Vessels⁴

2.4 Other Standard:

SAE J1086 Practice for Numbering Metals and Alloys (UNS)⁵

SNT-TC-1A Personnel Qualification and Certification in Nondestructive Testing⁶

3. Ordering Information

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

3.1.1 Quantity (feet, centimetres, or number of lengths),

3.1.2 Name of material (austenitic steel pipe),

3.1.3 Class (1.3). If not specified by the purchaser, the producer shall have the option to furnish either single-welded (SW) or double-welded (DW) pipe,

3.1.4 Grade (Table 2),

3.1.5 Size (NPS or outside diameter and schedule number or average wall thickness),

3.1.6 Length (specific or random), (Section 9),

3.1.7 End finish (section on Ends of Specification A999/A999M),

3.1.8 Optional requirements (hydrostatic or nondestructive electric test, Section 13,) (Supplementary Requirements S1 to S6),

3.1.9 Test report required (Section on Certification of Specification A999/A999M),

3.1.10 Specification number, and

3.1.11 Special requirements or exceptions to the specification.

4. Materials and Manufacture

4.1 Manufacture:

4.1.1 The pipe shall be made by a machine-welding or an automatic-welding process, welding from one or both sides and producing full penetration welds with no addition of filler metal in the welding operation.

4.1.2 Weld repairs, with the addition of compatible filler metal, may be made to the weld joint in accordance with the requirements of the section on Repair by Welding of Specification A999/A999M.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁴ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.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 Arlington Ln., Columbus, OH 43228-0518, <http://www.asnt.org>.