



Designation: B804 – 02 (Reapproved 2024)

Standard Specification for UNS N08367 and UNS N08926 Welded Pipe¹

This standard is issued under the fixed designation B804; 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 UNS N08367 and UNS N08926 welded pipe for general corrosion applications. (Although no restrictions are placed on the sizes of pipe that may be furnished under this specification, commercial practice is commonly limited to sizes not less than 8 in. nominal diameter.)

1.2 Six classes of pipe are covered as follows:

1.2.1 Class 1 pipe shall be double welded by processes employing filler metal in all passes and shall be completely radiographed.

1.2.2 Class 2 pipe shall be double welded by processes employing filler metal in all passes. No radiography is required.

1.2.3 Class 3 pipe shall be double welded by processes employing filler metal in all passes except the inside root weld may be made without the addition of filler metal. Welds are to be completely radiographed.

1.2.4 Class 4 pipe shall be double welded by processes employing filler metal in all passes except the inside root weld may be made without the addition of filler metal. No radiography is required.

1.2.5 Class 5 pipe shall be single welded by processes employing filler metal in all passes except that the pass exposed to the inside pipe surface may be made without the addition of filler metal. Welds are to be completely radiographed.

1.2.6 Class 6 pipe shall be single welded by processes employing filler metal in all passes except that the pass exposed to the inside pipe surface may be made without the addition of filler metal. No radiography is required.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 The following safety hazards caveat pertains only to the test methods portion, Section 13, of this standard: *This stan-*

dard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to become familiar with all hazards including those identified in the appropriate Safety Data Sheet (SDS) for this product/material as provided by the manufacturer, to establish appropriate safety, health, and environmental practices, and determine the applicability of regulatory limitations prior to use.

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.

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

B625 Specification for Ni-Fe-Cr-Mo-Cu-N Low-Carbon Alloy, Ni-Fe-Cr-Si Alloy, Cr-Ni-Fe-N Low-Carbon Alloy, Fe-Ni-Cr-Mo-Cu-N Alloy, and Ni-Fe-Cr-Mo-N Alloy Plate, Sheet, and Strip

B688 Specification for Chromium-Nickel-Molybdenum-Iron Plate, Sheet, and Strip

B880 Specification for General Requirements for Chemical Check Analysis Limits for Nickel, Nickel Alloys and Cobalt Alloys

B899 Terminology Relating to Non-ferrous Metals and Alloys

E8/E8M Test Methods for Tension Testing of Metallic Materials

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

E38 Methods for Chemical Analysis of Nickel-Chromium and Nickel-Chromium-Iron Alloys (Withdrawn 1989)³

¹ This specification is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.07 on Refined Nickel and Cobalt and Their Alloys.

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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.

³ The last approved version of this historical standard is referenced on www.astm.org.

E354 Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

E1019 Test Methods for Determination of Carbon, Sulfur, Nitrogen, and Oxygen in Steel, Iron, Nickel, and Cobalt Alloys by Various Combustion and Inert Gas Fusion Techniques

E1473 Test Methods for Chemical Analysis of Nickel, Cobalt, and High-Temperature Alloys

2.2 *ASME Boiler and Pressure Vessel Code*:⁴

Section VIII, Division 1 Rules for Construction of Pressure Vessels

Section IX Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators

2.3 *American Welding Society Standards*:⁵

AWS A5.11 Nickel and Nickel Alloy Covered Welded Electrodes

AWS A5.14 Nickel and Nickel Alloy Bare Welding Rods and Electrodes

3. Terminology

3.1 Terms defined in Terminology **B899** shall apply unless otherwise defined in this standard.

4. Ordering Information

4.1 It is the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Examples of such requirements include, but are not limited to, the following:

- 4.1.1 Quantity (feet or number of lengths),
- 4.1.2 Class (see **1.2**),
- 4.1.3 Size (outside diameter and minimum wall thickness),
- 4.1.4 Length (specific or random),
- 4.1.5 ASTM specification number,
- 4.1.6 Authorization for repair of plate defects by welding without prior approval if such is intended (see **9.4**),
- 4.1.7 Circumferential weld permissibility (see **8.3.2**), and
- 4.1.8 Supplementary requirements.

5. Materials and Manufacture

5.1 *Materials*—The starting material shall conform to the requirements of Specification **B688** for UNS N08367 and Specification **B625** for UNS N08926.

5.2 *Manufacture*:

5.2.1 The joints shall be double or single welded, full penetration welds made in accordance with ASME Boiler and Pressure Vessel Code, Section IX.

5.2.2 The welds shall be made either manually or automatically by an electric process involving the deposition of filler metal according to the class specified.

5.2.3 The weld surface on either side of the weld shall be flush with the base plate or shall have a reasonably uniform crown, not to exceed 1/8 in. (3.2 mm). Any weld reinforcement may be removed at the manufacturer's option or by agreement between the manufacturer and purchaser. The contour of the reinforcement shall be reasonably smooth and free of irregularities. The deposited metal shall be fused uniformly into the plate surface. No concavity of contour is permitted unless the resulting thickness of weld metal is equal to or greater than the minimum thickness of the adjacent base metal.

5.2.4 Weld defects shall be repaired by removal to sound metal and rewelding. Subsequent heat treatment and inspection shall be as required on the original welds.

5.3 *Heat Treatment*—The recommended heat treatment shall consist of heating to a minimum temperature of 2025 °F for UNS N08367 and 2012 °F for UNS N08926 followed by quenching in water or rapidly cooling by other means.

6. Chemical Composition

6.1 The chemical composition of the pipe shall conform to the requirements in Table 1 of Specification **B688** for UNS N08367 and Table 1 of Specification **B625** for UNS N08926.

6.2 The alloy content of the deposited weld metal shall conform to that required for the plate or the welding electrodes as shown in Specification AWS A5.11 for ENiCrMo-3, ENiCrMo-4, and ENiCrMo-10 or AWS A5.14 for ERNiCrMo-10, ERNiCrMo-3, and ERNiCrMo-4.

6.3 If product analysis is made of the plate or weld metal by the purchaser, the chemical composition thus determined shall conform to the requirements specified in **6.1** and **6.2** subject to the permissible tolerances in Specification **B880**.

7. Mechanical Properties and Other Requirements

7.1 *Mechanical Properties*:

7.1.1 The mechanical properties of the plate shall be in accordance with **Table 1**. Tension tests made by the plate manufacturer shall qualify the plate material.

7.1.2 Transverse tension tests taken across the welded joint shall have the same minimum ultimate tensile strength as the specified minimum ultimate tensile strength of the plate.

7.2 *Transverse Guided Weld Bend Test Requirements*—Bends made in accordance with **Fig. 1** shall be acceptable if no cracks or other imperfections exceeding 1/8 in. (3.2 mm) in any direction are present in the weld metal or between the weld and the pipe metal after bending. Cracks that originate along the

TABLE 1 Mechanical Property Requirements

	Gage	Tensile Strength, min		Yield Strength, min		Elongation in 2 in. or 50.8 mm, min, %
		ksi	MPa	ksi	MPa	
UNS N08367	≤3/16	100	690	45	310	30
	>3/16	95	655	45	310	30
UNS N08926		94	650	43	295	35

⁴ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

⁵ Available from American Welding Society (AWS), 550 NW LeJeune Rd., Miami, FL 33126, <http://www.aws.org>.