



Designation: **A134/A134M—18** **A134/A134M – 19**

Standard Specification for Pipe, Steel, Electric-Fusion (Arc)-Welded (Sizes NPS 16 and Over)¹

This standard is issued under the fixed designation A134/A134M; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers electric-fusion (arc)-welded straight seam or spiral seam steel pipe NPS 16 and over in diameter (inside or outside as specified by purchaser), with wall thicknesses up to $\frac{3}{4}$ in. [19 mm], inclusive. Pipe having other dimensions may be furnished provided such pipe complies with all other requirements of this specification. The pipe is available in various grades based on the ASTM specification ordered (Section 4).

NOTE 1—Acceptability for many services may be controlled by codes or standards such as those published by the American National Standards Institute and American Society of Mechanical Engineers.

NOTE 2—For testing methods not specifically covered in this specification, reference can be made to Test Methods and Definitions A370, with particular reference to Annex A2 on Steel Tubular Products.

NOTE 3—A comprehensive listing of standardized pipe dimensions is contained in ANSI B 36.10.

1.2 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. In this specification hard or rationalized conversions apply to diameter, lengths, and tensile properties. Soft conversion applies to other SI measurements.

NOTE 4—The dimensionless designator NPS (nominal pipe size) has been substituted in this standard for such traditional terms as “nominal diameter,” “size,” and “nominal size.”

1.3 The following caveat pertains specifically to Section 5 of this specification. *This standard 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 establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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

[A36/A36M Specification for Carbon Structural Steel](#)

[A283/A283M Specification for Low and Intermediate Tensile Strength Carbon Steel Plates](#)

[A285/A285M Specification for Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength](#)

[A370 Test Methods and Definitions for Mechanical Testing of Steel Products](#)

[A941 Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroalloys](#)

[A1011/A1011M Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength](#)

[A1018/A1018M Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Carbon, Commercial, Drawing, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength](#)

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 A01.09 on Carbon Steel Tubular Products.

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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.

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

A1058 [Test Methods for Mechanical Testing of Steel Products—Metric](#)

2.2 *ASME Boiler and Pressure Vessel Code*:³

[Section III](#)

[Section IX](#)

2.3 *American National Standards Institute Standard*:

[B 16.25 Buttwelding Ends](#)⁴

[B 36.10 Welded and Seamless Wrought Steel Pipe](#)⁴

3. Ordering Information

3.1 Orders for electric-fusion arc-welded pipe under this specification shall contain information concerning as many of the following items as are required, to describe the desired pipe adequately:

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

3.1.2 Name of material (electric-fusion (arc)-welded pipe),

3.1.3 ASTM Specification A134 or A134M and year date,

3.1.4 Grade (if applicable) of steel from which the pipe shall be made (Section 4),

3.1.5 Size (inside or outside diameter and nominal wall thickness), and

3.1.6 Length (specified or random).

3.2 The purchaser shall have the option to order additional requirements, including, but not limited to the following:

3.2.1 Specific straightness requirements (see 12.3),

3.2.2 End finish (Section 14),

3.2.3 Hydrostatic Test Pressure (Section 11),

3.2.4 Protective coating (Section 20),

3.2.5 End use of pipe, and

3.2.6 Other special or supplementary requirements, if any.

4. Material

4.1 The steel from which the pipe is made shall conform to Specifications [A36/A36M](#), [A283/A283M](#), [A285/A285M](#), [A1011/A1011M](#), [A1018/A1018M](#), or to other ASTM specifications for equally suitable weldable material, as specified. For purposes of marking and certification, when required, the pipe grade of material shall be established by the A xxx plate specification designation and plate grade, when applicable.

5. Manufacture

5.1 The longitudinal edges of the steel shall be shaped to give the most satisfactory results by the particular welding process employed. The steel shall then be properly formed and may be tacked preparatory to welding. The weld shall be made by automatic means (except tack welds) and shall be of reasonably uniform width and height for the entire length of the pipe. By agreement between the purchaser and the manufacturer, manual welding by qualified procedure and welders may be used as an equal alternate under this specification.

5.2 All longitudinal seams, spiral seams, and shop girth seams shall be butt-welded.

6. Number of Production Weld Tests

6.1 One weld test specimen specified in Section 8 shall be made from each lot of 3000 ft [900 m] of pipe or fraction thereof of each size and wall thickness.

6.2 If any test specimen shows defective machining or develops flaws not associated with the welding, it may be discarded and another specimen substituted.

6.3 Each length of pipe shall be subjected to the hydrostatic test specified in Section 11, unless otherwise specified in 11.3.

7. Retests

7.1 If any specimen tested in accordance with Section 10 fails to meet the requirements, retests of two additional specimens from the same lot of pipe shall be made, each of which shall meet the requirements specified. If any of the retests fail to conform to the requirements, test specimens may be taken from each untested pipe length at the manufacturer's option. Each specimen shall meet the requirements specified, or that pipe shall be rejected.

³ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

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

8. Test Specimens of Production Welds

8.1 The weld-test specimens for the reduced-section tension test shall be taken perpendicularly across the weld and from the end of the pipe or, alternatively, from flat test pieces of material conforming to the requirements in the specifications used in the manufacture of the pipe. The alternative weld-test specimens shall be welded with the same procedure and by the same operator and equipment, and in sequence with the welding of the longitudinal joints in the pipe. The test pieces shall have the weld approximately in the middle of the specimen. The specimens shall be straightened cold, and shall be tested at room temperature.

8.2 Reduced-section tension-test specimens shall be prepared in accordance with Fig. A2.3 of Test Methods and Definitions **A370**, Annex A2 Steel Tubular Products.

9. Qualification of Welding Procedure

9.1 The welding procedure shall be qualified in accordance with the American Welding Society Standard Qualification Procedure⁵ or ASME Section IX of the Boiler and Pressure Vessel Code as agreed to between the manufacturer and the purchaser using the tests and test values specified in **9.2** and **9.3**. Thicknesses less than $\frac{3}{8}$ in. [10 mm] shall be qualified for each wall thickness of pipe manufactured. Thicknesses $\frac{3}{8}$ to $\frac{3}{4}$ in. [10 mm to 19 mm], inclusive, shall be qualified in $\frac{3}{8}$ -in. [10-mm] thickness.

9.2 Two reduced-section tension specimens (transverse weld) made in accordance with Fig. A2.3 of Test Methods and Definitions **A370**, with the weld reinforcement removed, shall show a tensile strength not less than 100 % of the minimum specified tensile strength of the base material used.

9.3 Two face-bend test specimens shall be prepared in accordance with Section A2.5.1.7 of Test Methods and Definitions **A370** and shall withstand being bent 180° in a jig substantially in accordance with Fig. A2.15.3 of Test Methods and Definitions **A370**. The bend test shall be acceptable if no cracks or other defects exceeding $\frac{1}{8}$ in. [3 mm] in any direction be present in the weld metal or between the weld and the pipe metal after bending. Cracks that originate along the edges of the specimens during testing and that are less than $\frac{1}{4}$ in. [6 mm] in any direction, shall not be considered.

10. Tensile Properties of Production Welds

10.1 Reduced-section tension test specimens required in Section 8, taken perpendicularly across the weld with the weld reinforcement removed, shall show a tensile strength not less than 95 % of the specified minimum strength of the steel. At the manufacturer's option, the test may be made without removing the weld reinforcement, in which case the tensile strength shall be not less than the specified minimum tensile strength for the grade of steel used.

11. Hydrostatic Test (Note 5)

11.1 Each length of pipe shall be tested by the manufacturer to a hydrostatic pressure that will produce in the pipe wall a stress of 60 % of the specified minimum yield point of the steel used at room temperature. The pressure shall be determined by the following equation:

$$P = 2St/D$$

where:

P = minimum hydrostatic test pressure, psi (**Note 6**) (not to exceed 2800 psi [19 MPa]),

S = 0.60 times the minimum specified yield point of the steel used, psi [MPa],

t = specified wall thickness, in. [mm], and

D = specified outside diameter, in. [mm].

NOTE 5—A hydrostatic sizing operation is not to be considered a hydrostatic test or a substitute for it.

NOTE 6—When the diameter and wall thickness of pipe are such that the capacity limits of testing equipment are exceeded by these requirements, the test pressures may be reduced by agreement between the purchaser and the manufacturer.

11.2 Test pressure shall be held for not less than 5 s, or for a longer time as agreed upon between the purchaser and the manufacturer.

NOTE 7—When agreed upon between the purchaser and the manufacturer and so stated on the order, pipe may be tested to one and one half times the specified working pressure, except that the maximum test pressure shall not exceed 2800 psi [19 MPa] nor shall the maximum fiber stress exceed 85 % of specified minimum yield point of steel or to a fiber stress that does not exceed 85 % of the specified minimum yield point of the steel or 2800-psi [19-MPa] test pressure.

11.3 When specified in the order, pipe may be furnished without hydrostatic testing and each length so furnished shall include the mandatory marking of the letters “NH.” Additionally, the certification, when required, shall state “Not Hydrostatically Tested” and the specification number and material grade, as shown on the certification, shall be followed by the letters “NH.”

⁵ Available from American Welding Society (AWS), 8669 NW 36 St., #130, Miami, FL 33166-6672, <http://www.aws.org>.