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## Standard Specification for Electric-Resistance-Welded Steel Pipe<sup>1</sup>

This standard is issued under the fixed designation A135/A135M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

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

### 1. Scope\*

1.1 This specification<sup>2</sup> covers two grades of electric-resistance-welded steel pipe in NPS 2 to NPS 30 [DN 50 to DN 750] inclusive, with nominal (average) wall thickness up to 0.500 in. [12.70 mm], inclusive, and in nominal sizes NPS  $\frac{3}{4}$  to NPS 5 [DN 20 to DN 125] inclusive with nominal (average) wall thickness 0.083 in. [2.11 mm] to 0.134 in. [3.40 mm], depending on size. Pipe having other dimensions (Note 1) may be furnished provided such pipe complies with all other requirements of this specification. The pipe is intended for conveying gas, vapor, water or other liquid; only Grade A is adapted for flanging and bending (Note 2). The suitability of pipe for various purposes is somewhat dependent upon its dimensions, properties, and conditions of service, so that the purpose for which the pipe is intended should be stated in the order. The pipe may be furnished either nonexpanded or cold expanded at the option of the manufacturer. When pipe is cold expanded, the amount of expansion shall not exceed 1.5 % of the outside diameter pipe size.

NOTE 1—A comprehensive listing of standardized pipe dimensions is contained in ASME B36.10M.

NOTE 2—This provision is not intended to prohibit the cold bending of Grade B pipe.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system is to shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>3</sup>

- A370 [Test Methods and Definitions for Mechanical Testing of Steel Products](#)
- A700 [Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment](#)
- A751 [Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products](#)
- A865 [Specification for Threaded Couplings, Steel, Black or Zinc-Coated \(Galvanized\) Welded or Seamless, for Use in Steel Pipe Joints](#)
- A941 [Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroalloys](#)
- E6 [Terminology Relating to Methods of Mechanical Testing](#)
- E29 [Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications](#)
- E213 [Practice for Ultrasonic Testing of Metal Pipe and Tubing](#)
- E273 [Practice for Ultrasonic Examination of the Weld Zone of Welded Pipe and Tubing](#)
- E309 [Practice for Eddy-Current Examination of Steel Tubular Products Using Magnetic Saturation](#)
- E570 [Practice for Flux Leakage Examination of Ferromagnetic Steel Tubular Products](#)
- E1806 [Practice for Sampling Steel and Iron for Determination of Chemical Composition](#)

#### 2.2 ASME Standard:

- B1.20.1 [Pipe Threads, General Purpose](#)<sup>4</sup>
- B36.10M [Welded and Seamless Wrought Steel Pipe](#)<sup>4,5</sup>

#### 2.3 Federal Standards:

<sup>1</sup> 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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<sup>2</sup> For ASME Boiler and Pressure Vessel Code applications, see related Specification SA-135 in Section II of that Code.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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

<sup>5</sup> Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Three Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

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



Fed. STD No. 123 Marking for Shipments (Civil Agencies)<sup>6</sup>

Fed. STD No. 183 Continuous Identification Marking of Iron and Steel Products<sup>6</sup>

#### 2.4 Military Standards:

MIL-STD-129 Marking for Shipment and Storage MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage<sup>7</sup>

### 3. Terminology

3.1 For definitions of terms relating to steel manufacturing and properties, refer to Terminology A941.

3.2 For definitions of terms relating to mechanical testing, refer to Terminology E6.

#### 3.3 Definitions of Terms Specific to This Standard:

3.3.1 *burr, n*—a rough or sharp edge left on pipe ends by cutting or sawing.

3.3.2 *lot, n*—all pipe of the same size, wall thickness and rolled length that is produced from the same heat of steel and subject to the same heat treatment.

3.3.3 *black thread, n*—a thread crease exhibiting the original pipe surface after machining.

### 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 product (electric-resistance-welded pipe),

4.1.3 Specification designation and year of issue,

4.1.4 Grade (see Table 1),

4.1.5 Size (nominal size, NPS [DN], or outside diameter; and nominal wall thickness),

4.1.6 Length (specific or random, see 12.4),

4.1.7 End finish (plain or threaded, see 13.2),

4.1.7.1 Threaded and coupled, if specified,

4.1.7.2 Threads only, if specified,

4.1.7.3 Plain end, if specified,

4.1.8 Alternative electric test (see Section 11),

4.1.9 Tension test specimen (see Section 15),

4.1.10 Heat analysis, if required (see 6.1),

<sup>6</sup> Available from General Service Administration, Washington, DC 20405.

<sup>7</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094. Attn.: NOPD.

TABLE 1 Tensile Requirements

	Grade A	Grade B
Tensile strength, min, ksi [MPa]	48 [330]	60 [415]
Yield strength, min, ksi [MPa]	30 [205]	35 [240]
Elongation in 2 in. or [50 mm], min, %:		
For pipe having a specified wall thickness of $\frac{5}{16}$ in. [7.9 mm] or more, if tested using a longitudinal strip test specimen.	35	30
For pipe having a specified wall thickness of less than $\frac{5}{16}$ in. [7.9 mm], if tested using a longitudinal strip test specimen.	<sup>A</sup>	<sup>B</sup>
For pipe of any size, if tested using a full-size longitudinal test specimen.	35	30

<sup>A</sup> The minimum elongation shall be determined by the following equation, with the calculated value rounded to the nearest percent:

$$E = 56t + 16.5$$

$$[E = 2.2t + 16.5]$$

where:

$E$  = elongation in 2 in. or [50 mm], minimum, %, and

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

<sup>B</sup> The minimum elongation shall be determined by the following equation, with the calculated value rounded to the nearest percent:

$$E = 48t + 14$$

$$[E = 1.9t + 14]$$

where:

$E$  = elongation in 2 in. or [50 mm], minimum, %, and

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