



Standard Specification for Steel Wire, Pressure Vessel Winding¹

This standard is issued under the fixed designation A 905; 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 requirements for a high strength drawn and cold rolled steel wire in two strength classes, with rectangular cross section, and round mill edge. This wire is intended for prestressed vessel and press frame windings.

1.2 The values stated in either inch-pound units or SI (metric) units are to be regarded separately as standards. Within the text and tables, the SI units are shown in parentheses. The values stated in each system are not exact equivalents. Therefore, each system must be used independent of the other. Combining values from the two systems may result in nonconformance with the specification.

2. Referenced Documents

2.1 ASTM Standards:

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products²

A 510 Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel²

A 510M Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel [Metric]²

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment³

E 30 Methods for Chemical Analysis of Steel, Cast Iron, Open-Hearth Iron and Wrought Iron⁴

E 309 Practice for Eddy-Current Examination of Steel Tubular Products Using Magnetic Saturation⁵

2.2 Military Standard:

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage⁶

2.3 Federal Standard:

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)⁶

2.4 AIAG Standard:

AIAGB-5 02.00 Primary Metals Identification Tag Application Standard⁷

3. Ordering Information

3.1 Material furnished under this specification shall conform to the applicable requirements of the current edition of Specification A 510 or A 510M.

3.2 Orders for material under this specification shall include the following information for each ordered item.

3.2.1 Quantity (mass),

3.2.2 Name of material,

3.2.3 Dimensions (see Section 7),

3.2.4 Finish (see Section 8),

3.2.5 Packaging (see Section 11),

3.2.6 Heat analysis report (see 5.2),

3.2.7 Number of certification and test reports required,

3.2.8 ASTM designation and year of issue, and

3.2.9 Supplementary requirements, if any.

4. Material and Manufacture

4.1 The steel shall be produced by any of the following primary processes: (1) basic oxygen, and (2) electric furnace or vacuum induction (VIM). The primary melting may incorporate separate degassing or refining and may be followed by secondary melting by the electrode slag process (ESR) or the vacuum arc remelting process (VAR).

4.1.1 The steel may be ingot cast or continuously cast.

4.2 The finished wire shall be free from detrimental pipe and undue segregation.

4.3 The wire shall be cold drawn or cold rolled, or both, to produce the desired mechanical properties and dimensions after subjecting it to the patenting treatment.

4.4 The width to thickness ratio of the wire cross section shall not exceed 8.

5. Chemical Composition

5.1 The steel shall conform to the requirements for chemical composition prescribed in Table 1.

5.2 *Heat Analysis*—Each heat of steel shall be analyzed by the manufacturer to determine the percentage of elements prescribed in Table 1. This analysis shall be made from a test

¹ This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.03 on Steel Rod and Wire.

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² *Annual Book of ASTM Standards*, Vol 01.03.

³ *Annual Book of ASTM Standards*, Vol 01.05.

⁴ *Annual Book of ASTM Standards*, Vol 03.05.

⁵ *Annual Book of ASTM Standards*, Vol 03.03.

⁶ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁷ Available from the Automotive Industry Action Group, 26200 Lahser, Suite 200, Southfield, MI 48034.