



Designation: A 185 – 02

Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete¹

This standard is issued under the fixed designation A 185; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

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

1. Scope*

1.1 This specification covers welded wire reinforcement to be used for the reinforcement of concrete.

NOTE 1—Welded wire for concrete reinforcement has been described by various terms: welded wire fabric, WWF, fabric, and mesh. The wire reinforcement industry prefers the term “welded wire reinforcement” (WWR) as being more representative of the range of products being manufactured. Therefore, the term “welded wire fabric” has been replaced with the term “welded wire reinforcement” in this specification and in related specifications.

1.2 The values stated in inch-pound or SI units are to be regarded as standard. Within the text the inch-pound units are shown in parenthesis. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values may result in nonconformance with the specification.

2. Referenced Documents

2.1 ASTM Standards:

A 82 Specification for Steel Wire, Plain, for Concrete Reinforcement²

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

2.2 Military Standards:

MIL-STD-129 Marking for Shipment and Storage⁴

MIL-STD-163 Steel Mill Products Preparation for Shipment and Storage⁴

2.3 Federal Standard:

Fed. Std. No. 123 Marking for Shipments (Civil Agencies)⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

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 A01.05 on Steel Reinforcement.

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² Annual Book of ASTM Standards, Vol 01.04.

³ Annual Book of ASTM Standards, Vol 01.05.

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

3.1.1 *convoluted wire*—when wire for welded wire reinforcement is formed into a sinusoidal wave shape, it is commonly referred to as convoluted wire. The wire is used in the manufacture of cages for certain applications of concrete pipe reinforcing.

3.1.2 *welded wire reinforcement—as used within the scope and intent of this specification*, designates a material composed of cold-drawn steel wire, as-drawn or galvanized, fabricated into sheets or rolls by the process of electric resistance welding. The finished material shall consist essentially of a series of longitudinal and transverse wires arranged substantially at right angles to each other, and welded together at points of intersection.

4. Ordering Information

4.1 Orders for material to this specification should include the following information:

4.1.1 Quantity (weight or square area),

4.1.2 Name of material (welded wire reinforcement for concrete),

4.1.3 Wire spacings and sizes,

4.1.4 Minimum yield strength if Supplement S 1 of Specification A 82 applies.

4.1.5 Exclusion of oversteeling, if required (see 8.4.2),

4.1.6 Length and width of sheets or rolls,

4.1.7 Packaging (see Section 16), and

4.1.8 ASTM designation and year of issue.

NOTE 2—A typical ordering description is as follows: 10 000 ft² welded wire reinforcement for concrete, 4 × 12-W15 × W 6, in flat sheets 96 in. wide by 240 in. long, in secured lifts, to ASTM A 185– _____ .

5. Materials

5.1 The wire used in the manufacture of welded wire reinforcement shall conform to Specification A 82 and its Supplement S1 if so ordered.

5.2 Welded wire reinforcement shall be furnished either in flat sheets, or in rolls, as specified by the purchaser.

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

6. Manufacture

6.1 The wires shall be assembled by automatic machines or by other suitable mechanical means which will assure accurate spacing and alignment of all wires of the finished welded wire reinforcement.

6.2 Longitudinal and transverse wires shall be securely connected at every intersection by a process of electrical-resistance welding which employs the principle of fusion combined with pressure.

6.3 Wire of proper grade and quality when fabricated in the manner herein required shall result in a strong, serviceable mat-type product having substantially square or rectangular openings. It shall be fabricated and finished in a workmanlike manner, shall be free from injurious defects, and shall conform to this specification.

NOTE 3—A variation of manufacturing includes the application of one or more longitudinal convoluted wires at one edge of welded wire reinforcement for concrete pipe reinforcing cages. This shape allows the cage ends to be expanded to a larger diameter to accommodate the bell-shaped ends of concrete pipe.

7. Mechanical Property Requirements

7.1 *Tensile*—Wire for the production of welded wire reinforcement is described in Specification A 82. Tensile tests may be made on wire cut from the welded wire reinforcement and tested either across or between the welds; no less than 50 % shall be across welds. Tensile tests across a weld shall have the welded intersection located approximately at the center of the wire being tested and the cross wire forming the welded intersection shall extend approximately 25 mm (1 in.) beyond each side of the welded intersection.

NOTE 4—Tensile, reduction of area, and bend testing are normally done at the time the wire is drawn. The manufacturer's finished product still must satisfy the mechanical properties when tested after fabrication.

7.2 *Reduction of Area*—The ruptured section of the tensile specimen is measured to determine this property. In the case of a specimen which has been tested across a weld, the measurement shall be made only when rupture has occurred at a sufficient distance from the center of a weld to permit an accurate measurement of the fractured section. The wire shall meet the minimum reduction of area requirements of Specification A 82.

7.3 *Bend Test*—The wire shall withstand the bend test as described in Specification A 82 and shall be performed on a specimen taken from between the welds.

7.4 *Weld Shear Strength*—The weld shear strength between longitudinal and transverse wires shall be tested as described in Section 11. The minimum average shear value in Newtons shall be not less than 241 multiplied by the nominal area of the larger wire in square millimetres (or in pounds-force shall not be less than 35 000 multiplied by the nominal area of the larger wire in square inches). Typical examples of the 40 % or more wire size differential area as follows:

Larger	Smaller
Size No. W 20	Size No. W 8
Size No. W 15	Size No. W 6
Size No. W 10	Size No. W 4

7.4.1 Welded wire reinforcement having a relationship of longitudinal and transverse wires other than those covered in 7.4 shall not be subject to the weld shear requirement.

7.4.2 Weld-shear tests for determination of conformance to the requirements of 7.4 shall be conducted using a fixture as described in Section 11.

7.4.3 Four welds selected at random from the specimen described in 11.2 shall be tested for weld shear strength. The transverse wire of each test specimen shall extend approximately 25 mm (1 in.) on each side of the longitudinal wire. The longitudinal wire of each test specimen shall be of such length below the transverse wire so as to be adequately engaged by the grips of the testing machine. It shall be of such length above the transverse wire that its end shall be above the center line of the upper bearing of the testing device.

7.4.4 The material shall be deemed to conform to the requirements for weld shear strength if the average of the four samples complies with the value stipulated in 7.4. If the average fails to meet the prescribed value, all the welds across the specimen shall then be tested. The welded wire reinforcement will be acceptable if the average of all weld shear test values across the specimen meets the prescribed minimum value.

8. Dimensions, Mass, and Permissible Variations

8.1 *Width*—The width of welded wire reinforcement shall be considered to be the center-to-center distance between outside longitudinal wires. The permissible variation shall not exceed 13 mm (½ in.) greater or less than the specified width. In case the width of flat sheets or rolls is specified as the overall width (tip-to-tip length of cross wires), the width shall not vary more than ±25 mm (±1 in.) from the specified width.

8.2 *Length*—The overall length of flat sheets, measured on any wire, may vary ±25 mm (±1 in.), or 1 %, whichever is greater.

8.3 Overhang of the transverse wires shall not project beyond the centerline of each longitudinal edge wire more than a distance of 25 mm (1 in.), unless otherwise specified. When transverse wires are specified to project a specific length beyond the center line of a longitudinal edge wire, the permissible variation shall not exceed 13 mm (½ in.) greater or less than the specified length.

8.4 The permissible variation in diameter of any wire in the finished welded wire reinforcement shall conform to the tolerances prescribed for the wire before fabrication, in Specification A 82, with the following exceptions:

8.4.1 Because of the mechanical characteristics of fabricating welded wire reinforcement, the out-of-round requirements shall not apply.

8.4.2 Unless otherwise precluded by the purchaser, the manufacturer will be permitted to apply over-sized wire (not under-sized). The size differential shall not exceed one "W" size increment on sizes W 8 and smaller, and two "W" size increments on sizes larger than W 8. A "W" size increment is a whole number increment, for example, W 5 to W 6, or W 5.4 to W 6.4, etc. In all cases where such over-steeling is practiced, the producer shall identify the welded wire reinforcement with the style originally ordered.