



Designation: **A184/A184M – 17** **A184/A184M – 19**

## Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement<sup>1</sup>

This standard is issued under the fixed designation A184/A184M; 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 U.S. Department of Defense.*

### 1. Scope\*

1.1 This specification covers material in mat (or sheet) form fabricated from deformed steel bars to be used for the reinforcement of concrete. ~~Mats consist of~~ are made from two layers of bars that are assembled by welding the intersections at right angles to each other. ~~Mats are assembled by welding at the intersections.~~

1.2 This specification is applicable for orders in either inch-pound units (as Specification A184) or SI units (as Specification A184M).

1.3 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system ~~are~~ may not be exact equivalents; therefore, each system ~~must~~ shall be used independently of the other. Combining values from the two systems may result in ~~nonconformance~~ non-conformance with this specification.

1.4 The text of this specification references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the specification.

1.5 ~~This specification 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 specification standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.~~

1.6 ~~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:<sup>2</sup>

A615/A615M [Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement](#)

~~A700 Guide for Packaging, Marking, and Loading Methods for Steel Products for Shipment~~

A706/A706M [Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement](#)

#### 2.2 AWS Standard:<sup>3</sup>

[AWS D1.4/D1.4M Structural Welding Code – Steel Reinforcing Bars](#)

#### 2.3 U.S. Military Standard:<sup>4</sup>

[MIL-STD-129 Marking for Shipment and Storage](#)

#### 2.4 U.S. Federal Standard:<sup>4</sup>

[Fed Std No. 123 Marketing for Shipments \(Civil Agencies\)](#)

<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 A01.05 on Steel Reinforcement.

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<sup>2</sup> 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.

<sup>3</sup> Available from American Welding Society (AWS), 8669 NW 36 St., #130, Miami, FL 33166-6672, <http://www.aws.org>.

<sup>4</sup> Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

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



### 3. Ordering Information

- 3.1 Orders for welded steel bar mats for concrete reinforcement under this specification shall contain the following information:
  - 3.1.1 Quantity of mats,
  - 3.1.2 Bar designation number (size), length, and spacing of bars in each direction,
  - 3.1.3 Grade required (Grade 40 or 60) [280 or 420],
  - 3.1.4 Type of steel (see Section 4.1), and
  - 3.1.5 ASTM designation ~~A184/A184M~~ and year of issue.

~~NOTE 1—A typical ordering description is as follows: 1000 bar mats to ASTM A184—; fabricated from Grade 40 bars to ASTM A615—; 6 by 6 in.; No. 4 by 120 in. longitudinal tip to tip, outer bars spaced 54 in.; No. 3 by 60 in. transverse, outer bars spaced 114 in. [1000 bar mats to ASTM A184M—; fabricated from Grade 280 bars to ASTM A615M—; 150 by 150 mm; No. 10 by 3000 mm longitudinal tip to tip, outer bars spaced 1350 mm; No. 10 by 1500 mm transverse, outer bars spaced 2850 mm.]~~

- 3.2 The purchaser shall have the option to specify additional requirements, including but not limited to, the following:
  - 3.2.1 Requirements for inspection (10.1),
  - 3.2.2 Packaging and special package marking requirements (Section 12), and
  - 3.2.3 Other special requirements, if any.

### 4. Materials and Manufacture

4.1 Deformed steel bars of Grades 40 [280] used in the manufacture of welded mats shall conform to Specification A615 [A615M]. Deformed steel bars of Grade 60 [420] used in the manufacture of welded mats shall conform to Specification A615 [A615M] or A706 [A706M].

### 5. Fabrication

- 5.1 Fabricated mats shall be composed of two layers of bars substantially parallel and perpendicular to each other.
  - 5.1.1 Mats shall be assembled by means of welding to provide attachment at intersections.
    - 5.1.1.1 Welds shall provide attachment at all exterior intersections and at not less than alternate interior intersections.
    - 5.1.1.2 The separation of 5 % or less of all welded intersections of any mat shall not be cause for rejection provided that no more than ~~half one-half~~ of the welds on any one bar are separated.
    - 5.1.1.3 ~~Welding shall be performed in such a manner that accordance with AWS D1.4/D1.4M and the strength and ductility/elongation requirements of the material specifications specifications for reinforcing bars in Section 4 are shall be met when a specimen is tested across a point of weld. Bend tests shall be performed on specimens taken from between the welds.~~

~~NOTE 2—Welding of the mat intersections has generally been performed without problems, but care should be taken when welding reinforcing bars with carbon equivalent levels above 0.55 %, in order to prevent cracking in the weld area.~~

### 6. Mechanical Properties

6.1 Mats shall be capable of withstanding a static load of 150 lbf [670 N] exerted perpendicular to the plane of the mat tending to separate the bars with no apparent loosening when applied to one intersection of the connected bars.

#### 6.2 Number of Tests:

6.2.1 ~~One sample test specimen~~ consisting of not less than two ~~connections—welded intersections~~ on the same transverse ~~member~~ bar shall be tested for conformance with the ~~provisions~~ requirements of 5.1.1.3 and 6.1 from each 75 000 ft<sup>2</sup> [7000 m<sup>2</sup>] of mats or fraction thereof.

#### 6.3 Test Methods:

6.3.1 Tension test specimens for determining conformance with 5.1.1.3 shall have a welded ~~joint~~ intersection located approximately at the center of the bar being tested, and the ~~cross~~ transverse bar shall extend approximately 1 in. [25 mm] beyond each side. All unit stress determinations shall be based on the nominal area calculated using the nominal diameter specified.

6.3.2 Tests of ~~connections—welded intersections~~ against separation shall be performed on an assembled mat by placing blocks under a deformed bar in the upper layer and applying the prescribed load upon the bar in the lower layer.

### 7. Size, Dimensions, and Tolerances

7.1 *Size and Spacing Dimensions*—The sizes, spacings, dimensions, and arrangement of the bar mats shall conform to the ~~design~~ requirements specified by the purchaser. Bars shall extend beyond exterior intersections a distance of not less than 1 in. [25 mm]. The spacing of bars shall average that ~~specified~~ ~~inrequired~~ by the ~~design~~ purchaser, and the ~~space~~ center-to-center spacing between individual bars shall not vary more than ¼ in. [6 mm] from that specified.

7.2 *Width and Length Tolerances*—The overall length or width of the mats shall not be more than 1 in. [25 mm] greater or less than the specified dimension.

### 8. Finish and Surface Condition

- 8.1 The finished mats shall be free of injurious defects in material or workmanship.