Designation: A 184/A 184M – 06

Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement[1]

This standard is issued under the fixed designation A 184/A 184M; 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 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 two layers of bars that are assembled 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 A 184) or SI units (as Specification A 184M).

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

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 615/A 615M Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

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

A 706/A 706M Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

2.2 *U.S. Military Standard:*

MIL-STD-129 Marking for Shipment and Storage[3]

2.3 *U.S. Federal Standard:*

Fed Std No. 123 Marketing for Shipments (Civil Agencies)[3]

3. Ordering Information

3.1 It shall be the responsibility of the purchaser to specify all requirements that are necessary for material ordered to this specification. Such requirements shall include, but are not limited to, the following:

3.1.1 Quantity,

3.1.2 Size and spacing of members in each direction,

3.1.3 Grade required (Grade 40 or 60) [280 or 420],

3.1.4 Type of steel as appropriate (see Section 4),

3.1.5 ASTM designation A 184/A 184M and year of issue.

NOTE 1—A typical ordering description is as follows: 1000 bar mats to ASTM A 184– ; fabricated from Grade 40 bars to ASTM A 615– ; 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 A 184M– ; fabricated from Grade 280 bars to ASTM A 615M– ; 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.]

4. Material and Manufacture

4.1 Deformed steel bars of Grades 40 [280] used in the manufacture of welded mats shall conform to Specification A 615 [A 615M]. Deformed steel bars of Grade 60 [420] used in the manufacture of welded mats shall conform to Specification A 615 [A 615M] or A 706 [A 706M].

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 of the welds on any one bar are separated.

5.1.1.3 Welding shall be performed in such a manner that the strength and ductility requirements of the material specifications in Section 4 are met when a specimen is tested across a point of weld.

[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] 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.

[3] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS. Or visit: http://assist.daps.dla.mil/online.

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

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NOTE 2—Welding of the mat intersections has generally been performed without problems, but care should be taken when welding reinforcing bars without 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 consisting of not less than two connections on the same transverse member shall be tested for conformance with the provisions of 5.1.1.3 and 6.1 from each 75 000 ft^2 [7000 m^2] 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 located approximately at the center of the bar being tested, and the cross 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 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 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 in the design, and the space 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.

8.2 Rust, surface seams, surface irregularities, or mill scale shall not be cause for rejection provided the weight, dimensions including height of deformation, cross-sectional area, and tensile properties of a hand wire-brushed test specimen are not less than the requirements of this specification.

9. Rejection and Retests

9.1 Fabricated mats that do not meet the requirements of this specification shall be rejected and reported to the manufacturer within 5 working days from the receipt of samples by the purchaser.

9.2 In case a test specimen fails to meet the provisions of 6.1, two additional samples shall be selected and tested. All retest specimens shall meet the requirements of this specification.

9.3 In case a test specimen fails to meet the provisions of 5.1.1.3, all of the remaining bars on the transverse member shall be tested and the average of all tests (including the original test) shall meet the requirements specified in 5.1.1.3.

10. Inspection and Test Reports

10.1 *Inspection*—The inspector representing the purchaser shall have free entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's plant that concern the fabrication of the mats ordered. The manufacturer shall afford the inspector all reasonable facilities to satisfy the inspector that the mats are being furnished in accordance with this specification. All tests and inspection shall be made at the place of fabrication prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with fabricating operations. Inspection as to general workmanship shall be visual.

10.2 *Test Reports on Bar Material*—The manufacturer shall supply test reports showing that the material used in the fabrication of the mats as delivered has fulfilled the tension and bend test requirements of the specified type and grade described in Section 4. The reports shall show the manufacturer's test identification numbers, including the identity of the material.

10.3 A material test report, certificate of inspection, or similar document printed from or used in electronic form from an electronic data interchange (EDI) transmission shall be regarded as having the same validity as a counterpart printed in the certifier's facility. The content of the EDI transmitted document must meet the requirements of the invoked ASTM standard(s) and conform to any existing EDI agreement between the purchaser and the supplier. Notwithstanding the absence of a signature, the organization submitting the EDI transmission is reponsible for the content of the report.

NOTE 3—The industry definition as invoked here is: EDI is the computer-to-computer exchange of business information in a standard format such as ANSI ASC X12.

10.4 *For Government Procurement Only*— Except as otherwise specified in the contract, the contractor shall be responsible for the performance of all inspection and test requirements specified herein. Except as otherwise specified in the contract, the contractor shall be permitted to use one's own or any other suitable facilities for the performance of the inspection and test requirements specified herein, unless disapproved by the purchaser at the time of purchase. The purchaser shall have the right to perform any of the inspections and tests at the same frequency as set forth in this specification where such inspections are deemed necessary to assure that material conforms to prescribed requirements.

11. Rehearing

11.1 Samples tested in accordance with this specification that represent rejected material shall be preserved for 2 weeks from the date rejection is reported to the manufacturer. In case of dissatisfaction with the results of the tests, the manufacturer shall have the right to make claim for a hearing within that time.

12. Packaging and Package Marking

12.1 Packaging, marking, and loading for shipment shall be in accordance with Practices A 700.

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12.2 When specified in the contract or order, and for direct procurement by or direct shipment to the U.S. government, marking for shipment, in addition to requirements specified in the contract or order, shall be in accordance with MIL-STD-129 for military agencies and with Fed. Std. No. 123 for civil agencies.

12.3 Each bundle of mats shall be marked with a suitable tag showing the name of the manufacturer and other marking to identify it with the order.

13. Keywords

13.1 concrete reinforcement; mats; steel bars

SUMMARY OF CHANGES

Committee A01 has identifed the location of the following changes to this standard since the last issue (A 184/A 184M – 05) that may impact the use of this standard. (Approved March 1, 2006).

(1) Revised sections 2.1, 2.2, and Section 12.

Committee A01 has identifed the location of the following changes to this standard since the last issue (A 184/A 184M – 01) that may impact the use of this standard. (Approved March 1, 2005.)

(1) Sections 1.1, 2.1, 3.1, 3.1.3, 4.1, 10.4 (formerly section 10.3), 11.1, and Note 1 were revised.

(2) Section 10.3 and Note 3 were added.

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