



Standard Practice for Identification Marking of Aluminum and Magnesium Products¹

This standard is issued under the fixed designation B 666/B 666M; 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 practice establishes the physical item marking requirements for identification purposes for aluminum and magnesium products. Package marking for shipment and inspection acceptance is not within the scope of this standard.

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 shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.3 *This 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 standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 The following documents of the issue in effect on the date of material purchase form a part of this specification to the extent referenced herein:

2.2 ASTM Standards:²

B 361 Specification for Factory-Made Wrought Aluminum and Aluminum-Alloy Welding Fittings

B 404/B 404M Specification for Aluminum and Aluminum-Alloy Seamless Condenser and Heat-Exchanger Tubes with Integral Fins³

B 547/B 547M Specification for Aluminum and Aluminum-Alloy Formed and Arc-Welded Round Tube

¹ This practice is under the jurisdiction of ASTM Committee B07 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.03 on Aluminum Alloy Wrought Products.

Current edition approved July 15, 2008. Published August 2008. Originally approved in 1980. Last previous edition approved in 2001 as B 666/B 666M – 01.

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³ Withdrawn.

B 881 Terminology Relating to Aluminum- and Magnesium-Alloy Products

2.3 ANSI Standards:

H35.1/H35.1(M) Alloy and Temper Designation Systems for Aluminum⁴

2.4 Military Standards:

MIL-STD-409 Alloy Nomenclature and Temper Designation System for Magnesium Base Alloys⁵

3. Terminology

3.1 *Definitions*—Refer to Terminology **B 881** for definitions of product terms used in this specification.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 Marking:

3.2.2 *spot marking*—marking the identification only once on the product.

3.2.3 *continuous marking*—recurring marking of the identification in intervals not greater than 40 in. [1000 mm] throughout the length of the product.

3.2.4 *perimeter marking*—marking continuously the identification in one or two rows adjacent to the four edges of the product.

3.2.5 *tagging*—attaching tags bearing the required identification markings to coils, bundles, or containers of items which are too small to mark or whose configuration preclude marking otherwise.

4. Basic Marking Requirements and Application

4.1 When this practice is required by the material specification or specified in the contract or purchase order, wrought aluminum and magnesium mill products shall be marked for identification purposes only with the following information on the product or on tags attached to the product:

⁴ Available from Aluminum Association, Inc., 1525 Wilson Blvd., Suite 600, Arlington, VA 22209, <http://www.aluminum.org>.

⁵ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://www.dodssp.daps.mil>.

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

4.1.1 *Name or Registered Trademark of the Company*, which performs the final processing or finishing operation such as rolling, stretching, thermal treatment, etc., prior to marketing the product;

NOTE 1—The company that performs nothing more than a simple shearing or sawing operation may be excluded from marking the product with its name.

4.1.2 *Alloy and Temper of the Product*—Designations shall be in accordance with ANSI H35.1/H35.1M for aluminum and **MIL-STD-409** for magnesium;

4.1.3 *Basic Number of the Specification to which the Product was Produced*—The basic number does not include the revision indicator;

4.1.4 *Specified (Ordered) Dimensions of the Following Products*:

4.1.4.1 *Sheet and Plate*—Thickness in inches [millimetres],

4.1.4.2 *Coiled Wire and Spooled Wire*—Diameter in inches [millimetres],

4.1.4.3 *Tube*:

(1) *Straight Lengths*—Outside diameter and wall thickness, in inches [millimetres],

(2) *Coiled*—Wall thickness, in inches [millimetres],

4.1.4.4 *Pipe*—Nominal pipe size and ANSI schedule number;

4.1.5 Lot number shall be included in the product marking. The definition of lot shall be that as defined in the material specification.

4.1.6 For magnesium products, the applicable lot number shall be marked on each piece in at least one location.

4.1.7 When required by the material specification, the word “seamless” on certain tube or pipe.

NOTE 2—The requirements specified in 4.1 are minimum; marking systems that involve additional information shall be as agreed upon between the producer and the purchaser.

4.2 When this practice is required by the material specification or specified in the contract or purchase order, marking of cast aluminum products shall be in accordance with Section 6.

4.3 Product marking shall be such that it shall not rub off or be otherwise obliterated by contact arising from normal handling, exposure to the elements, shipment, and storage. The height of the characters shall be commensurate with the size of the product being marked; for example, not less than 0.375 in. [9 mm] for flat sheet and plate, not less than 0.250 in. [6 mm] for hand forgings and not less than 0.125 in. [3 mm] for tubular products. Legibility of all markings shall be such as required for ready readability and the required permanency of identification.

4.4 Product marking shall be accomplished in a manner that will not adversely affect the subsequent fabrication of the material, or produce stresses that would be deleterious to the functioning of the finished product. Marking on the product shall be with marking fluid applied by printing, stamping, or stenciling. Ghost images of the characters may remain upon the removal of marking applied. Impression stamping is considered detrimental and shall not be used except on ingot, castings, forging, and certain tube products, or when required by prior agreement between the producer and purchaser.

5. Marking of Wrought Aluminum and Magnesium Mill Products

5.1 When this practice is required by the material specification or specified in the contract or purchase order, wrought aluminum and magnesium mill products shall be marked as follows:

5.1.1 *Lot Number; All Products*—Spot marking the product.

5.1.2 *Coiled Sheet*—Spot marking in one or more rows near the outside end as shown in Fig. 1 [1M].

5.1.3 *Flat Sheet and Plate*:

5.1.3.1 Flat sheet less than 0.012 in. [up through 0.30 mm] (for O temper, less than 0.020 in. [up through 0.50 mm]) in thickness—Spot marking near one end,

5.1.3.2 Plate and flat sheet 0.012 in. and over [over 0.30 mm] (for O temper, 0.020 in. and over [over 0.50 mm]) in thickness and less than 6 in. [up through 150 mm] wide—Continuous marking in one row,

5.1.3.3 Plate up through 0.375 in. [10 mm] and flat sheet 0.012 in. and over [over 0.30 mm] (for O temper, 0.020 in. and over [over 0.50 mm]) in thickness, 6 through 60 in. [over 150 through 1500 mm] in width, and 36 through 200 in. [over 1000 through 5000 mm] in length—Continuous marking in rows running the direction of rolling on 6 in. [150 mm] centers across the width on one surface as shown in Fig. 2 [2M] and Fig. 3[3M]. Using the marking pattern of Fig. 2 [2M], every third row shall contain the producer’s name or trademark and the ordered thickness. The other two rows shall each contain the alloy and temper and the specification number, and shall be staggered. Using the marking pattern of Fig. 3[3M], there are two alternating rows. One row shall contain the producer’s name or trademark and the ordered thickness, and the alternating row shall contain the alloy and temper and the specification number. Both the marking patterns shown in Fig. 2[2M] and Fig. 3[3M] provide the same information and either can be used.

5.1.3.4 Plate over 0.375 in. [10 mm] in thickness, flat sheet and plate over 60 in. [1500 mm] in width or over 200 in. [5000 mm] in length—Same marking as 5.1.3.3 or perimeter marking

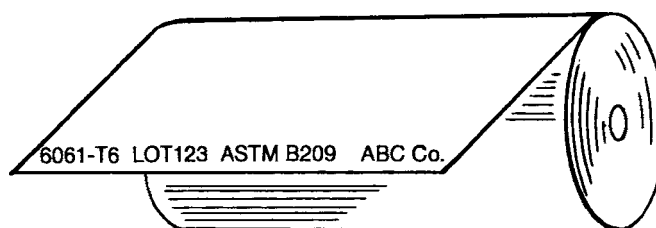


Fig. 1 Spot Marking for Coiled Sheet

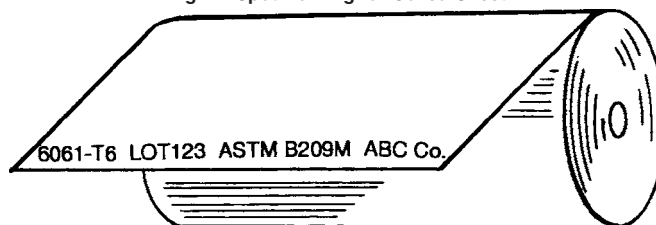
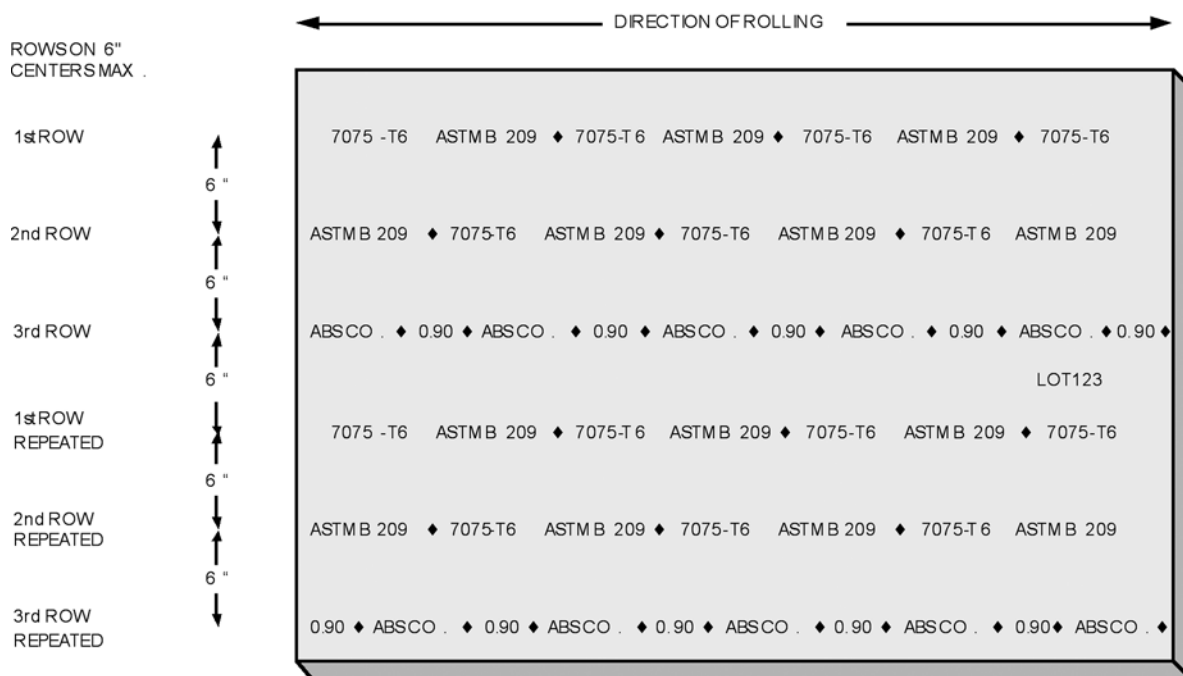
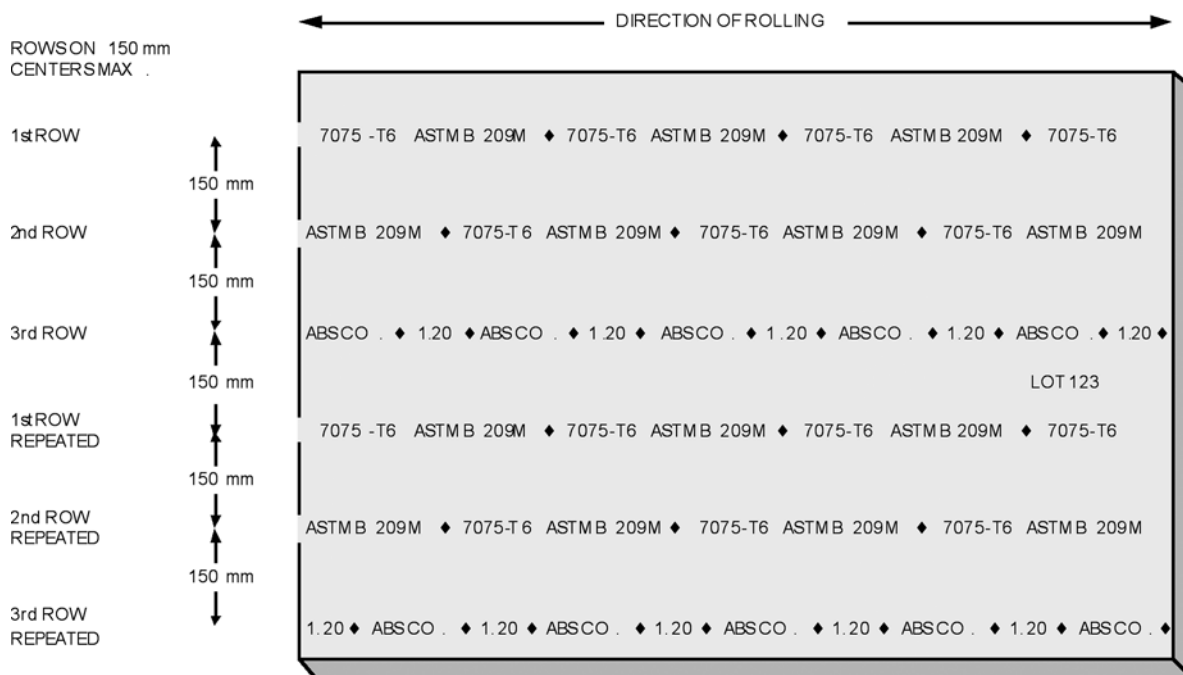


FIG. 1 M Spot Marking for Coiled Sheet



Note—Marking pattern is three staggered rows: two rows contain alloy, temper, and specification number, and every third row contains producer's name and ordered thickness. Figure shows spot marking of the lot number.

FIG 2 Continuous Marking for Plate Through 0.375 in. and Flat Sheet 0.012 in. and over (for O Temper, 0.020 in. and over) in Thickness, 6 Through 60 in. in Width, and 36 Through 200 in. in Length



Note—Marking pattern is three staggered rows: two rows contain alloy, temper, and specification number, and every third row contains producer's name and ordered thickness. Figure shows spot marking of the lot number.

FIG. 2 M Continuous Marking for Plate Through 10 mm and Flat Sheet over 0.30 mm (for O Temper, over 0.50 mm) in Thickness, over 150 Through 1500 mm in Width, and 1000 Through 5000 mm in Length

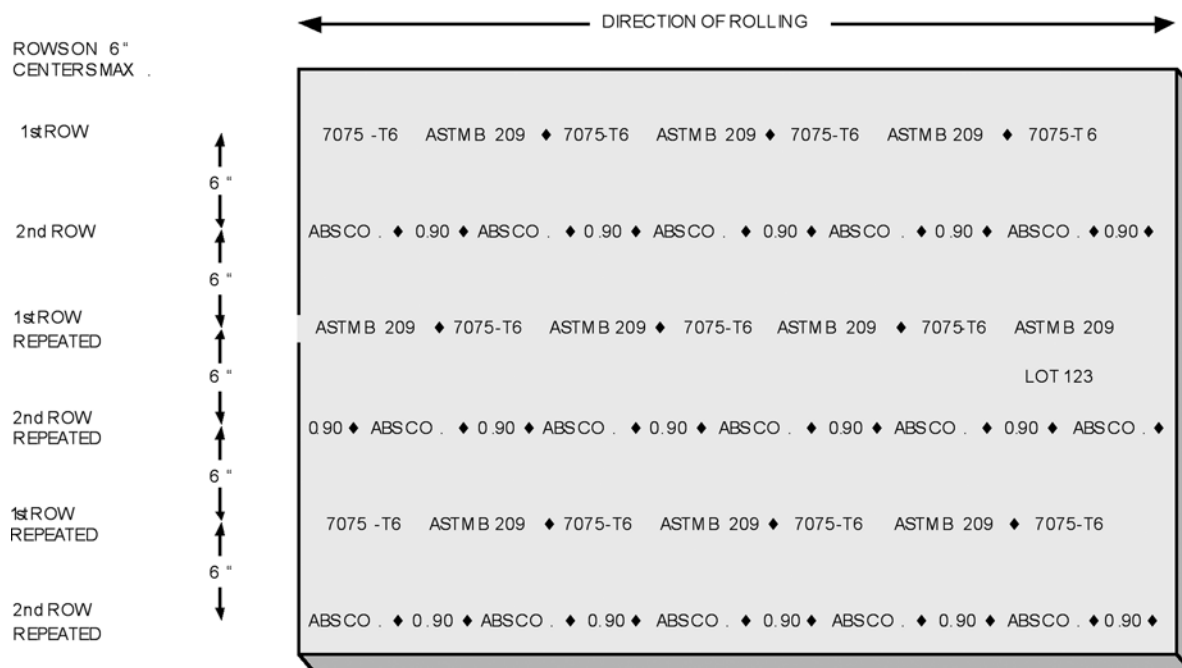
on one surface. When perimeter marking of two rows is chosen, one row shall contain the producer's name or trade-mark and the ordered thickness, and the second row shall contain alloy and temper, and the specification number as shown in Fig. 4 [4M].

NOTE 3—If perimeter marking is applied to a full piece as produced but

partial sheets or plates are supplied, an arrow shall be applied near one corner of each partial sheet or plate indicating the direction of rolling.

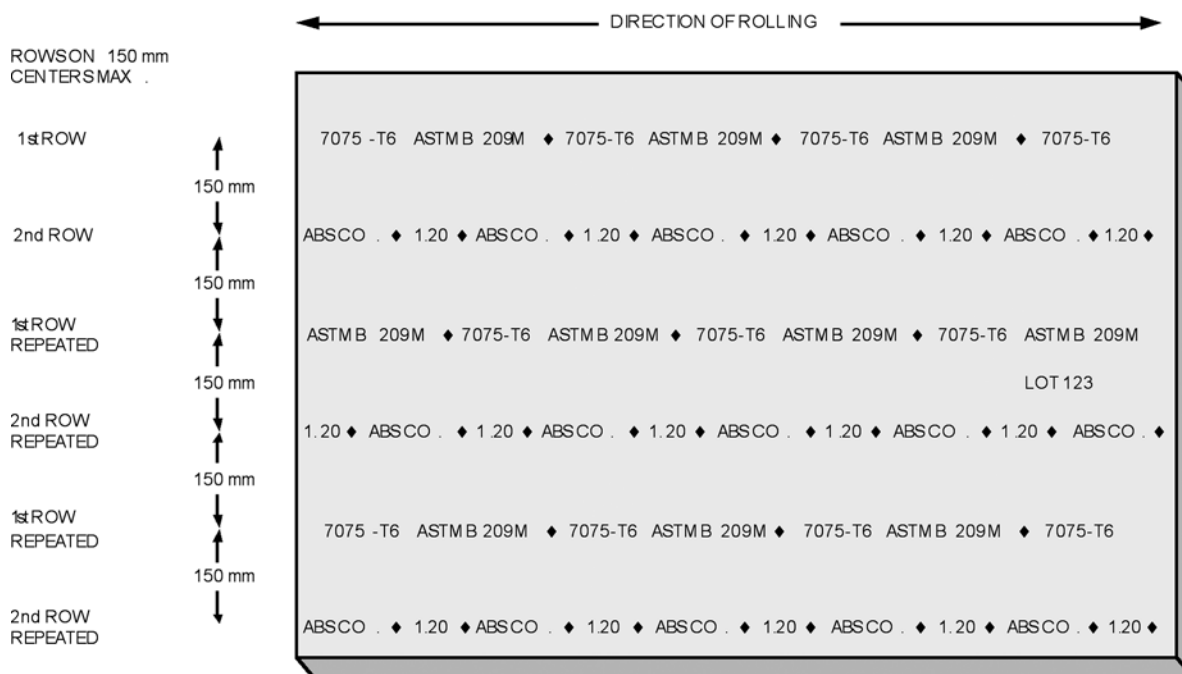
5.1.4 Circles:

5.1.4.1 Circles 24 in. and over [over 600 mm] in diameter—Spot marking on each circle unless the circle was cut from sheet or plate having continuous marking, and



Note—Marking pattern is two alternating rows: one row contains alloy, temper, and specification number, and the alternating row contains the producer's name and ordered thickness. Figure shows spot marking of the lot number.

FIG 3 Continuous Marking for Plate Through 0.375 in. and Flat Sheet 0.012 in. and over (for O Temper, 0.020 in. and over) in Thickness, 6 Through 60 in. in Width, and 36 Through 200 in. in Length.



Note—Marking pattern is two alternating rows: one row contains alloy, temper, and specification number, and the alternating row contains the producer's name and ordered thickness. Figure shows spot marking of the lot number.

FIG. 3 M Continuous Marking for Plate Through 10 mm and Flat Sheet over 0.30 mm (for O Temper, over 0.50 mm) in Thickness, over 150 Through 1500 mm in Width, and 1000 Through 5000 mm in Length.

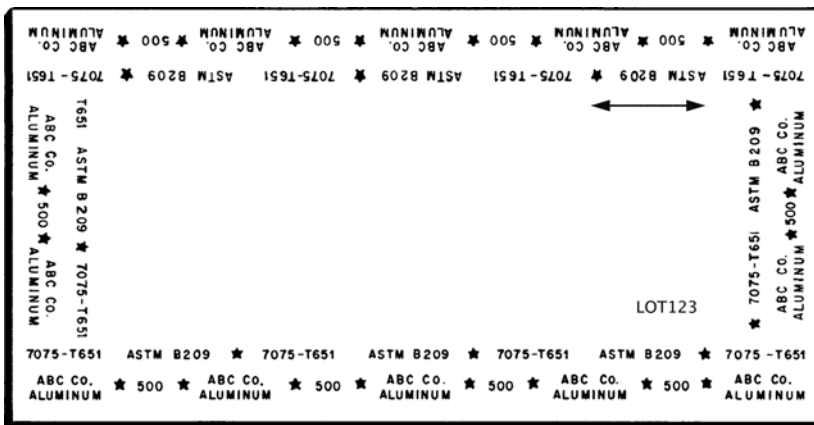
5.1.4.2 Circles less than 24 in. [up through 600 mm] in diameter—Tagging or marking of shipping container.

NOTE 4—Alclad one side flat sheet, plate, circles, and coiled sheet shall be marked on the bare side.

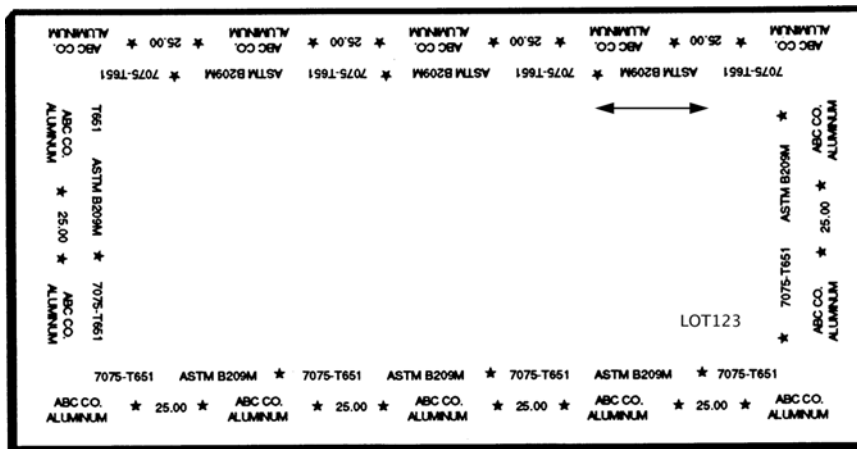
5.1.5 Tread Plate—Spot marking near one end on the back side.

5.1.6 Foil—Marking of this product is not required. Package marking only.

5.1.7 Rod, Bar, and Extruded Profiles—Continuous marking of straight lengths as shown in Fig. 5 [5M], of sizes having an accessible flat surface of ½ in. or more [over 12.5 mm] in width (with less than ⅛ in. [3 mm and less] indented surface),



Note—Figure shows spot marking of the lot number. Arrow indicates the rolling direction.



Note—Figure shows spot marking of the lot number. Arrow indicates the rolling direction.

FIG. 4 M Perimeter Marking for Plate over 10 mm in Thickness, Flat Sheet and Plate over 1500 mm in Width or over 5000 mm in Length.

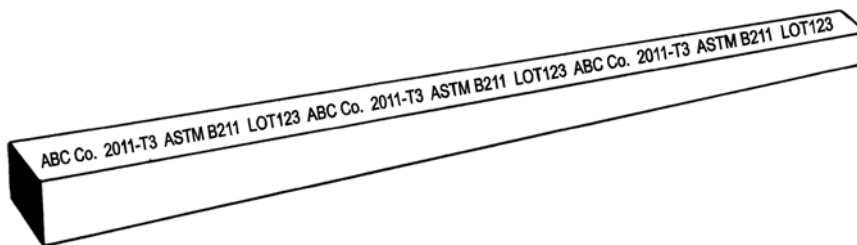


FIG 5 Continuous Marking for Rod, Bar, Profiles, and Tube in Straight Lengths

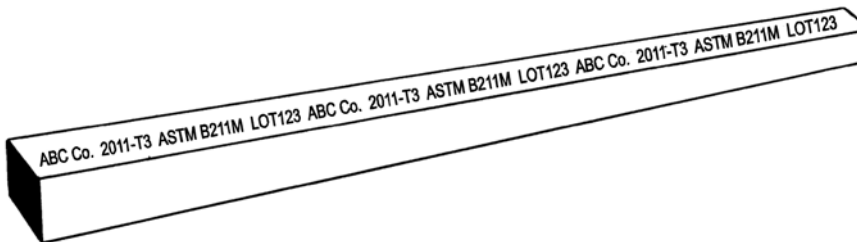


FIG. 5 M Continuous Marking for Rod, Bar, Profiles, and Tube in Straight Lengths

or a diameter of ½ in. [over 12.5 mm] or more. Tagging is applicable to smaller sizes, lengths under 3 ft [1 m] and coils.

5.1.8 *Structural Profiles*—Spot marking near one end as shown in Fig. 6 [6M].

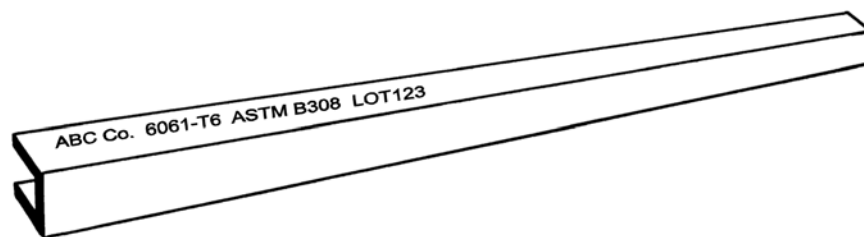


FIG 6 Spot Marking for Structural Profiles

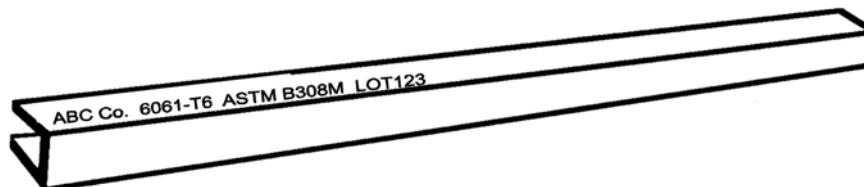


FIG. 6 M Spot Marking for Structural Profiles

5.1.9 *Tube and Pipe*—Continuous marking of non-round straight lengths in a single row of sizes having both a wall thickness of 0.029 in. and greater [over 0.72 mm] and a flat surface of ½ in. or more [over 12.5 mm] in width. Continuous marking of round straight lengths in a single row of sizes having both a wall thickness of 0.029 in. and greater [over 0.72 mm] and a diameter of ½ in. or more [over 12.5 mm]. Tagging is applicable to each coil or bundle of smaller sizes and lengths under 3 ft [1 m].

5.1.10 *Wire*—Tagging of coils and straight lengths, and spot marking on one flange of spools.

5.1.11 *Bus Bar*—Spot marking near one end except that specification number shall not be required to be marked on this product.

5.1.12 *Forgings*:

5.1.12.1 *Hand Forging*—Spot marking on one place of each piece.

5.1.12.2 *Die Forging*—Marking in accordance with the requirements of the forging drawing.

6. Marking of Cast Aluminum Products

6.1 *Castings*—Marking shall be that as specified by the applicable material specification or as agreed upon between the producer and the purchaser.

6.2 *Remelt Ingot for Castings*:

6.2.1 *Marking of Aluminum Ingot*—The producer's name or trademark (see 4.1.1), alloy designation (see 4.1.2) and cast number shall be impression-stamped or otherwise permanently marked on each ingot or if strapped together, not less than four ingots in each bundle, two in the top layer and two in the bottom layer. Specification number shall not be required to be marked on this product.

6.2.2 *Marking of Magnesium Ingot*—The producer's name or trademark (see 4.1.1), alloy designation (see 4.1.2), and cast number shall be impression-stamped or otherwise permanently marked on each ingot or bundle, if strapped together. Specification number shall not be required to be marked on this product.

6.3 *Ingot or Billet for Fabricating*—When specified in the contract or purchase order, marking shall include the producer's name or trademark, alloy and cast number. Specification data shall not be required to be marked on these products.

7. Marking of Unalloyed Aluminum and Magnesium Ingot

7.1 When specified in the contract or purchase order, unalloyed aluminum ingot shall be marked as follows:

7.1.1 Producer's name, logo, or trademark,

7.1.2 Production location either permanently cast in, impression stamped, or otherwise marked,

7.1.3 Metal grade or aluminum designation impression stamped or otherwise marked with legible characters, and

7.1.4 Cast number, or other identification, by convention which allows traceability of specific ingot to a specific chemical composition.

7.2 When specified in the contract or purchase order, unalloyed magnesium ingot shall be permanently marked on each ingot, pig, billet, or pallet as follows:

7.2.1 Producer's name or trademark,

7.2.2 Cast number, or other identification by convention which allows traceability of the product to a specific chemical composition.

8. Marking of Special Products

8.1 When specified in the contract or purchase order, marking of special products that are not covered in this specification shall be in accordance with that specified by the applicable material specification.

8.2 Special products that are to be marked in accordance with requirements in the applicable material specification are welding fittings (Specification **B 361**); condenser and heat exchanger tubes with integral fins (Specifications **B 404/B 404M**); and formed and arc-welded round tube (Specification **B 547/B 547M**).

9. Keywords

9.1 aluminum products; identification markings; magnesium products

SUMMARY OF CHANGES

Committee B07 has identified the location of selected changes to this standard since the last issue (B 666/B 666M – 01) that may impact the use of this standard. (Approved July 15, 2008)

- | | |
|---|---|
| <p>(1) Deleted ANSI H35.1(M) in Section 2 and replaced ANSI H35.1 with H35.1/H35.1(M).</p> <p>(2) Provided reference to B 881 for definitions of terminology and deleted definitions that are provided in B 881.</p> <p>(3) Section 4.1.5 was re-worded to require marking of lot number.</p> <p>(4) Section 4.2 was deleted since lot number marking is a general requirement of 4.1.5.</p> <p>(5) Added Fig. 3[3M] with alternative marking pattern of two alternating rows.</p> <p>(6) Replaced lot designation “AB12345” with “LOT123” in Fig. 2 [2M] to be consistent with Fig. 1 [1M].</p> <p>(7) Provided notes in Fig. 2 [2M] and Fig. 3[3M] to identify two distinct marking patterns.</p> | <p>(8) Renumbered Figures to accommodate addition of a new Fig. 3[3M].</p> <p>(9) Added text to clarify that rolling direction is to be marked on “each partial sheet or plate”.</p> <p>(10) Reference to the lot number marking in the schematics of the Figures was included in Figure notes.</p> <p>(11) Lot number marking was added to the schematics of Figs. 4-6.</p> <p>(12) Arrow indicating rolling direction has been added to Fig. 4 [4M] along with an explanation in a figure note.</p> <p>(13) Inserted <i>Lot Number, All Products</i> – Spot marking the product as 5.1.1 and renumbered subsequent sections.</p> <p>(14) Added reference to this practice for clarity in sections 4.1 and 4.2.</p> <p>(15) Change 6061–T to 6061–T6 in Fig. 1[1M].</p> |
|---|---|

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).