



Designation: B209/B209M – 21a

Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate¹

This standard is issued under the fixed designation B209/B209M; 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 U.S. Department of Defense.

1. Scope*

1.1 This specification² covers aluminum and aluminum-alloy flat sheet, coiled sheet, and plate in the alloys (Note 1) and tempers shown in Tables 2, 3, 4, and 5, and in the following finishes:

1.1.1 Plate in all alloys and sheet in heat-treatable alloys: mill finish.

1.1.2 Sheet in nonheat-treatable alloys: mill finish, one-side bright mill finish, standard one-side bright finish, and standard two-sides bright finish.

1.2 Alloy and temper designations are in accordance with ANSI H35.1/H35.1M. The equivalent Unified Numbering System alloy designations are those of Table 1 preceded by A9, for example, A91100 for aluminum 1100 in accordance with Practice E527.

NOTE 1—Throughout this specification, use of the term *alloy* in the general sense includes aluminum as well as aluminum alloy.

NOTE 2—See Specification B632/B632M for tread plate.

NOTE 3—See Specification B928/B928M for 5xxx-H116 and 5xxx-H321 aluminum alloys containing 3 % or more nominal magnesium and intended for marine service and similar environments. Other alloy-temper products listed in this specification, which do not require the additional corrosion testing/capability called out in Specification B928/B928M, may be suitable for marine and similar environment applications.

1.3 For acceptance criteria for inclusion of new aluminum and aluminum alloys in this specification, see Annex A2.

1.4 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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

2.2 ASTM Standards:³

- B548 Test Method for Ultrasonic Inspection of Aluminum-Alloy Plate for Pressure Vessels
- B557 Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products
- B557M Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products (Metric)
- B594 Practice for Ultrasonic Inspection of Aluminum-Alloy Wrought Products
- B632/B632M Specification for Aluminum-Alloy Rolled Tread Plate
- B660 Practices for Packaging/Packing of Aluminum and Magnesium Products
- B666/B666M Practice for Identification Marking of Aluminum and Magnesium Products
- B881 Terminology Relating to Aluminum- and Magnesium-Alloy Products
- B918/B918M Practice for Heat Treatment of Wrought Aluminum Alloys
- B928/B928M Specification for High Magnesium Aluminum-Alloy Products for Marine Service and Similar Environments
- B947 Practice for Hot Rolling Mill Solution Heat Treatment

¹ This specification 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.

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² For ASME Boiler and Pressure Vessel Code applications see related Specification SB-209 in Section II of that Code.

³ 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.

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



for Aluminum Alloy Plate

B985 Practice for Sampling Aluminum Ingots, Billets, Castings and Finished or Semi-Finished Wrought Aluminum Products for Compositional Analysis

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E34 Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys (Withdrawn 2017)⁴

E290 Test Methods for Bend Testing of Material for Ductility

E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

E607 Test Method for Atomic Emission Spectrometric Analysis Aluminum Alloys by the Point to Plane Technique Nitrogen Atmosphere (Withdrawn 2011)⁴

E716 Practices for Sampling and Sample Preparation of Aluminum and Aluminum Alloys for Determination of Chemical Composition by Spark Atomic Emission Spectrometry

E1004 Test Method for Determining Electrical Conductivity Using the Electromagnetic (Eddy Current) Method

E1251 Test Method for Analysis of Aluminum and Aluminum Alloys by Spark Atomic Emission Spectrometry

G34 Test Method for Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test)

G47 Test Method for Determining Susceptibility to Stress-Corrosion Cracking of 2XXX and 7XXX Aluminum Alloy Products

2.3 ANSI Standards:⁵

H35.1/H35.1M American National Standard Alloy and Temper Designation Systems for Aluminum

H35.2 American National Standard Dimensional Tolerances for Aluminum Mill Products

H35.2M American National Standard Dimensional Tolerances for Aluminum Mill Products (Metric)

2.4 ISO Standards:⁶

ISO 209-1 Wrought aluminium and aluminium alloys – Chemical composition and forms of products – Part 1: Chemical composition

ISO 2107 Aluminium and aluminium alloys – Wrought products – Temper designations

ISO 6361-2 Wrought aluminium and aluminium alloys – Sheets, strips and plates – Part 2: Mechanical properties

2.5 AMS Specification:⁷

AMS2772 Heat Treatment of Aluminum Alloy Raw Materials

2.6 CEN Standard:⁸

CEN - EN 14242 Aluminium and aluminium alloys – Chemical analysis – Inductively coupled plasma optical

emission spectral analysis

3. Terminology

3.1 Definitions:

3.1.1 Refer to Terminology **B881** for definitions of product terms used in this specification.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *capable of*—the term *capable of*, as used in this specification, means that the test need not be performed by the producer of the material; however, should testing by the purchaser establish that the material does not meet these requirements, the material shall be subject to rejection.

4. Ordering Information

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

4.1.1 This specification designation (which includes the number, the year, and the revision letter, if applicable).

4.1.2 Quantity in pieces or pounds.

4.1.3 Alloy (**7.1**).

4.1.4 Temper (**9.1**).

4.1.5 Finish for sheet in nonheat-treatable alloys (Section 1).

4.1.6 For sheet, whether flat or coiled.

4.1.7 Dimensions (thickness, width, and length or coil size).

4.1.8 Tensile property limits and dimensional tolerances for sizes not covered in **Table 2**, **Table 3**, **Table 4**, or **Table 5** of this specification or in ANSI H35.2 [H35.2M].

4.2 Additionally, orders for material meeting the requirements of this specification shall include the following information when required by the purchaser:

4.2.1 Whether a supply of one of the pairs of tempers where shown in **Table 2** or **Table 3**, (H14 or H24) or (H34 or H24), is specifically excluded (**Table 2** and **Table 3**, Footnote C).

4.2.2 Whether heat treatment in accordance with Practice **B918/B918M** is required (**8.2**).

4.2.3 Whether solution heat treatment using the hot rolling mill is acceptable (**8.3**).

4.2.4 Whether bend tests are required (**12.1**).

4.2.5 Whether testing for stress-corrosion cracking resistance of alloy 2124-T851, 2219-T851, or 2219-T87 is required (**13.1**).

4.2.6 Whether ultrasonic inspection for aerospace or pressure vessels applications is required (Section 17).

4.2.7 Whether inspection or witness of inspection and tests by the purchaser's representative is required prior to material shipment (**18.1**).

4.2.8 Whether certification is required (Section 22).

4.2.9 Whether there are exceptions to identification marking as provided in **B666/B666M** (**20.1**).

4.2.10 Whether Practices **B660** apply and, if so, the levels of preservation, packaging, and packing required (**21.3**).

4.2.11 For sheet and plate with tensile properties having more than one test direction shown in **Table 2**, **Table 3**, **Table 4**, and **Table 5**, whether tensile testing should be in a direction other than the direction specified in Test Method **B557** or **B557M** (Subsection 9.4).

⁴ The last approved version of this historical standard is referenced on www.astm.org.

⁵ Available from Aluminum Association, 1400 Crystal Dr., Suite 430, Arlington, VA 22202, <http://www.aluminum.org>.

⁶ Available from International Organization for Standardization (ISO), ISO Central Secretariat, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <https://www.iso.org>.

⁷ Available from SAE International (SAE), 400 Commonwealth Dr., Warrendale, PA 15096, <http://www.sae.org>.

⁸ Available from European Committee for Standardization (CEN), Avenue Marnix 17, B-1000, Brussels, Belgium, <http://www.cen.eu>.