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Standard Terminology Relating to Aluminum- and Magnesium-Alloy Products[1]

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1. Scope*

1.1 This terminology covers the principal terms and definitions relating to aluminum- and magnesium-alloy products. It is published to encourage uniformity of terminology throughout Committee B07 product specifications.

1.2 Certain definitions and definitions of terms specific to a standard will remain in the individual standards and will not be included in this terminology (see 3.4).

2. Referenced Documents

2.1 *ASTM Standards:*[2]

B 26/B 26M Specification for Aluminum-Alloy Sand Castings
B 80 Specification for Magnesium-Alloy Sand Castings
B 85 Specification for Aluminum-Alloy Die Castings
B 90/B 90M Specification for Magnesium-Alloy Sheet and Plate
B 91 Specification for Magnesium-Alloy Forgings
B 92/B 92M Specification for Unalloyed Magnesium Ingot and Stick ~~for~~For Remelting
B 93/B 93M Specification for Magnesium Alloys in Ingot Form for Sand Castings, Permanent Mold Castings, and Die Castings
B 94 Specification for Magnesium-Alloy Die Castings
B 107/B 107M Specification for Magnesium-Alloy Extruded Bars, Rods, ~~Shapes,~~Profiles, Tubes, and Wire
B 108 Specification for Aluminum-Alloy Permanent Mold Castings
B 179 Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from ~~all~~All Casting Processes
B 199 Specification for Magnesium-Alloy Permanent Mold Castings
B 209 Specification for Aluminum and Aluminum-Alloy Sheet and Plate
B 210 Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes
B 211 Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire
B 221 Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, ~~Shapes,~~Profiles, and Tubes
B 234 Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes for Condensers and Heat Exchangers
B 236 Specification for Aluminum Bars for Electrical Purposes (Bus Bars)
B 241/B 241M Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube
B 247 Specification for Aluminum and Aluminum-Alloy Die Forgings, Hand Forgings, and Rolled Ring Forgings
B 308/B 308M Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles
B 313/B 313M Specification for Aluminum and Aluminum-Alloy Round Welded Tubes
B 316/B 316M Specification for Aluminum and Aluminum-Alloy Rivet and Cold-Heading~~-~~ Wire and Rods
B 317/B 317M Specification for Aluminum-Alloy Extruded Bar, Rod, Tube, Pipe, ~~and~~ Structural Profiles, and Profiles for Electrical Purposes (Bus Conductor)
B 345/B 345M Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube for Gas and Oil Transmission and Distribution Piping Systems
B 361 Specification for Factory-Made Wrought Aluminum and Aluminum-Alloy Welding Fittings
B 373 Specification for Aluminum Foil for Capacitors
B 403 Specification for Magnesium-Alloy Investment Castings
B 404/B 404M Specification for Aluminum and Aluminum-Alloy Seamless Condenser and Heat-Exchanger Tubes with Integral Fins

[1] This terminology 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 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.**

B429 429/B 429M Specification for Aluminum-Alloy Extruded Structural Pipe and Tube
B 479 Specification for Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications
B 483/B 483M Specification for Aluminum and Aluminum-Alloy Drawn TubesTube and Pipe for General Purpose Applications
B 491/B 491M Specification for Aluminum and Aluminum-Alloy Extruded Round Tubes for General-Purpose Applications
B 547/B 547M Specification for Aluminum and Aluminum-Alloy Formed and Arc-Welded Round Tube
B 594 Practice for Ultrasonic Inspection of Aluminum-Alloy Wrought Products for Aerospace Applications
B 618 Specification for Aluminum-Alloy Investment Castings
B 632/B 632M Specification for Aluminum-Alloy Rolled Thread Plate Specification for Aluminum-Alloy Rolled Tread Plate
B 646 Practice for Fracture Toughness Testing of Aluminum Alloys
B 660 Practices for Packaging/Packing of Aluminum and Magnesium Products
B 666/B 666M Practice for Identification Marking of Aluminum and Magnesium Products
B 686 Specification for Aluminum Alloy Castings, High-Strength
B 736 Specification for Aluminum, Aluminum Alloy, and Aluminum-Clad Steel Cable Shielding Stock Specification for Aluminum, Aluminum Alloy and Aluminum-Clad Steel Cable Shielding Stock
B 744/B 744M Specification for Aluminum Alloy Sheet for Corrugated Aluminum Pipe
B 745/B 745M Specification for Corrugated Aluminum Pipe for Sewers and Drains
B 746/B 746M Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches
B 807/B 807M Practice for Extrusion Press Solution Heat Treatment offor Aluminum Alloys
B 917/B 917M Practice for Heat Treatment of Aluminum-Alloy Castings from All Processes
B 918 Practice for Heat Treatment of Wrought Aluminum Alloys
B928/B928Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service 928/B 928M Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environments
B 945 Practice for Aluminum Alloy Extrusions Press Cooled from an Elevated Temperature Shaping Process for Production of T1, T2, T5 and T10Type Tempers
B 947 Practice for Hot Rolling Mill Solution Heat Treatment for Aluminum Alloy Plate
B 955/B 955M Specification for Aluminum-Alloy Centrifugal Castings

3. Terminology

3.1 *Definitions*—The definitions are grouped by subject and listed in alphabetical order. Alclad,

Alclad, *adj*— having an aluminum or aluminum-alloy coating that is metallurgically bonded to either one side or both surfaces of an aluminum alloy product, and that is anodic to the alloy to which it is bonded, thus electrolytically protecting the core alloy against corrosion. (See also individual product type such as *Alclad plate*, *Alclad sheet*, and so forth). **B 209, B 210, B 211, B 221, B 234, B 241/B 241M, B 313/B 313M, B 345/B 345M, B 404/B 404M, B 547/B 547M bar,**

bar, *n*—solid wrought product that is long in relation to its cross section, is square or rectangular with sharp or rounded corners/edges (excluding plate and flattened wire), or is a regular hexagon or octagon, and in which at least one perpendicular distance between parallel faces is 0.375 in. or greater [over 10.00 mm]. —solid wrought product that is long in relation to its cross section which is square or rectangular (excluding plate and flattened wire) with sharp or rounded corners or edges, or is a regular hexagon or octagon, typically supplied in straight length

NOTE 1: In North America, the minimum perpendicular distance between at least one set of parallel faces of a bar is 0.375 in. or >10 mm; below this limit the product is called ″wire″.

NOTE 2: In Europe, a bar is supplied in straight length; if supplied in coiled form, the product is called ″wire″. **B 107/B 107M, B 211, B 221, B 236, B317, B 317/B 317M, B 594, B 666/B 666M**

bus bar, n— rigid electric conductor in the form of a bar. **B 236, B317, B 317/B 317M, B 666/B 666M**

extruded bar, n—bar brought to final dimensions by hot extruding. **B 107/B 107M, B 221, B 236, B317 , B 317/B 317M**

rolled bar, n—bar brought to final dimensions by hot rolling. **B 211, B 236**

saw-plate bar, n—bar brought to final thickness by hot or cold rolling and to final width by sawing. **B 236 bus conductor,**

bus conductor, *n*—rigid electric conductor of any cross section. **B 236, B317**

casting, , *B 317/B 317M*

casting, *n*—metal object, at or near dimensions shape, produced by introducing molten metal into a mold or a die and allowing it to solidify. — product at or near finished shape, formed by solidification of the metal in a mold or a die. **B 666/B 666M, B 686**

centrifugal casting, n—casting produced by introducing molten metal into a rotating mold and allowing it to solidify as the mold is spun about a horizontal, inclined or vertical axis. **B 955/B 955M**

centrifuged casting, n—a casting produced in a mold, a number of which may be mounted around a central sprue. The molds are rotated, in a vertical position, about a central axis concentric with the central sprue, **B 955/B 955M**

die casting, n—casting produced by introducing molten metal under substantial pressure into a metal die and characterized by a high degree of fidelity to the die cavity. —casting produced by introducing molten metal under substantial pressure into a metal

die and characterized by a high degree of fidelity to the die cavity. The term ″pressure die casting″ or ″high pressure die casting″ is often used for this concept. **B 85, B 94**

investment casting, n—~~casting produced by surrounding (investing) an expendable pattern (usually wax or plastic) with a refractory slurry that sets at room temperature, after which the pattern is removed through the use of heat, and the resultant cavity is filled with molten metal and allowed to solidify.~~ —precision casting formed by a three step process comprising:

a) fabrication of a ceramic mold around a wax or thermoplastic pattern with a refractory slurry that sets at room temperature;

b) removal of the pattern through the use of heat;

c) pouring metal into this mold and allowing it to solidify. **B 403, B 618**

permanent mold casting, n—casting produced by introducing molten metal by gravity or low pressure into a mold constructed of durable material, usually iron or steel, and allowing it to solidify.

NOTE: permanent mold casting where the metal solidifies in a metal mold under low pressure (typically less than 1 bar above atmospheric pressure) is also referred to as ″low pressure die casting″. **B 108, B 199**

precision casting, n—casting which fulfils special requirements concerning tolerances on form and dimensions. Precision castings can be produced by different casting processes.

sand casting, n—casting produced by pouring molten metal into a sand mold and allowing it to solidify. **B 26/B 26M, B 80**

semi-permanent mold casting, n—permanent mold casting which is made using an expendable core such as sand. **B 108, B 199** ~~**circle,**~~

circle, *n*— circular blank fabricated from plate, sheet, or foil. **B 666/B 666M** ~~**extrudate,**~~

extrudate, *n*— material exiting an extrusion die subject to further processing (quenching, stretching, cutting), to become an extruded profile. ~~**B807**~~

~~**extrusion billet,**~~ **B 807/B 807M**

extrusion billet, *n*—~~solid or hollow form, commonly cylindrical,~~—extrusion ingot cut to length and used as the final length of material charged into the extrusion press ~~cylinder, and~~cylinder. It is usually a cast ~~product,~~product but may be a wrought product or sintered from powder compact. **B 807/B 807M**

~~**extrusion ingot,** *n*—solid or hollow cast form, usually cylindrical, suitable for extruding. **B807**~~

~~**extrusion log,** —*ingot, intended and suitable for extruding, typically of solid circular cross-section, sometimes with a central hollow or a flattened cross-section.* **B 807/B 807M**~~

~~**extrusion log,** *n*—starting stock for extrusion billet. Extrusion log is usually produced in lengths from which shorter extrusion billets are cut. **B807**~~

~~**foil,** —*extrusion ingot not cut to length. Extrusion log is usually produced in lengths from which shorter extrusion billets are cut.* **B 807/B 807M**~~

~~**foil,** *n*—rolled wrought product, rectangular in cross section, and of thickness less than 0.006 in. [up through 0.15 mm].~~ — flat rolled product of rectangular cross-section with uniform thickness equal to or less than 0.0079 in. (0.20 mm [200 microns]). In the USA there is an overlap in the thickness range 0.006-0.0079 in. (0.15-0.20 mm) defined for foil and sheet. Foil products in this gage range are supplied to foil product specifications. **B 373, B 479, B 666/B 666M**

bright two-side foil, n—foil having a uniform bright specular finish on both sides. **B 373, B 479**

matte one-side foil, n—foil having a diffuse reflecting finish on one side and a bright specular finish on the other. (Also called pack rolled foil.) **B 373, B 479** ~~**forging,**~~

forging, *n*—~~metal part worked to a predetermined shape by one or more processes such as hammering, upsetting, pressing, rolling, and so forth.~~ — wrought product formed by hammering or pressing, typically when hot, between open dies (hand forging) or closed dies (drop or die forging). **B 91, B 247, B 666/B 666M**

blocker-type forging, n—forging made in a single set of impressions to the general contour of a finished part. **B 247**

die forging, n—~~forging formed to the required shape and size by working in impression dies.~~ —forging shaped by working in closed dies. **B 91, B 247, B 594, B 666/B 666M**

hammer forging, n—forging produced by repeated blows of a forging hammer. **B 91**

hand forging, n—~~forging, manually-manipulated, which is worked, through repeated strokes or blows, between flat or simply shaped dies.~~ —forging worked between flat or simply shaped dies by repeated strokes or blows and manipulation of the piece, intending to convert the metallurgical structure from cast to wrought prior to machining into a final part. **B 247, B 594, B 666/B 666M**

rolled ring forging, n—cylindrical product of relatively short height, circumferentially rolled from a hollow section. **B 247, B 594** ~~**forging stock,**~~

forging stock, *n*—~~wrought or cast rod, bar, or other section suitable for forging.~~ —solid product, typically ingot, rod, bar or profile, intended and suitable for forging. Forging stock is typically a cast product or an extruded product. **B 247** ~~**ingot,**~~

ingot, *n*—~~cast form suitable for fabricating (rolling, forging, extruding, and so forth) or remelting.~~ — cast product intended and suitable for remelting or forming by hot or cold working. **B 92/B 92M, B 93/B 93M, B 179, B 666/B 666M** ~~**mill finish,**~~

mill finish, *adj*—having a ~~nonuniform~~ naturally occurring finish after rolling which may vary from piece to piece and within a piece, and which may not be entirely free of stains or oil. See also *mill finish sheet & mill finish plate* . **B 209, B 632/B 632M** ~~**parent coil or plate,**~~

parent coil, *n*—~~coil of sheet or a plate that has been processed to final temper as a single unit and may subsequently be cut into two or more smaller coils or into individual sheets or smaller plates to provide the required width and length.~~ —coil processed to final temper as a single unit, intended to be slit and/or cut into smaller coils or into individual sheets or plates. (Also known as master coil) **B 209 ~~pipe,~~**

parent plate, *n*—plate processed to final temper as a single unit, intended to be cut into smaller plates. **B 209**

pipe, *n*— tube in standardized combination of outside diameter and wall thickness, commonly designated by "Nominal Pipe Sizes" and "ANSI Schedule Numbers." **B 241/B 241M~~, B317~~, B 317/B 317M, B 345/B 345M~~, B429~~, B 429/B 429M, B 666/B 666M**

drawn pipe, n—pipe brought to final dimensions by drawing through a die. **B 241/B 241M, B 345/B 345M**

extruded pipe, n—pipe formed by hot extruding. **B 241/B 241M~~, B317~~, B 317/B 317M, B 345/B 345M~~, B429~~ , B 429/B 429M**

seamless pipe, n—extruded or drawn pipe which does not contain any line junctures resulting from the method of manufacture. **B 241/B 241M, B 345/B 345M**

structural pipe, n—pipe commonly used for structural purposes. ~~**B429**~~

~~**plate:,**~~ **B 429/B 429M**

plate, *n*— rolled product that is rectangular in cross section, with thickness not less ~~then~~than 0.250 in. (6.30 mm) and sheared or sawed edges. **B 90/B 90M, B 209, B 632/B 632M~~, B660, B666/B666M~~, B 660, B 666/B 666M, B 928/B 928M**

Alclad plate, n—~~composite plate product comprised of an aluminum-alloy core having on both surfaces a metallurgically bonded aluminum or aluminum-alloy cladding that is anodic to the core, thus electrolytically protecting the core against corrosion.~~ **~~B209~~—plate having on one or both surfaces a metallurgically bonded aluminum coating that is anodic to the core, thus electrolytically protecting the core against corrosion. If on one side only is clad, the product is often named "Alclad One Side Plate."** **B 209, B 547/B 547M**

mill finish plate, n—~~plate having a non-uniform finish which may vary from piece to piece and within a piece, and which may not be entirely free of stains or oil.~~ **~~B209~~—plate having a finish defined by the actual roll grinding and rolling conditions, without further specification from a customer or a standard. The finish of mill finish plate can vary from plate to plate or within one plate.** **B 209, B 632/B 632M, B 928/B 928M**

tread plate, n—~~plate or sheet having a raised, figured pattern on one surface to provide improved traction.~~ —sheet or plate upon which a pattern has been impressed on one side by rolling using a specially prepared roll with an appropriate pattern, to provide improved traction. **B 632/B 632M, B 666/B 666M ~~producer,~~**

producer, *n*— primary manufacturer of the material. **B 107/B 107M, B 209, B 210, B 211, B 221, B 234, B 241/B 241M, B 308/B 308M, B 313/B 313M, B 316/B 316M~~, B317~~, B 317/B 317M, B 345/B 345M, B 361, B 373, B 404/B 404M, B 483/B 483M, B 491/B 491M, B 632/B 632M, B 736 ~~profile,~~**

profile, *n*— wrought product that is long in relation to its cross sectional dimensions which is of a form other than that of sheet, plate, foil, rod, bar, tube, or wire. For profiles sometimes the term "shape" or "section" is used. **B 107/B 107M, B 221, B 308/B 308M~~, B317~~, B 317/B 317M, B 594, B 666/B 666M**

extruded profile, n—~~profile produced by hot extruding.~~ —profile brought to final dimensions by extruding. **B 107/B 107M, B 221**

structural profile, n—profile, rolled or extruded, commonly used for structural purposes such as angles, channels, H-beams, I-beams, tees, and zees. **B 308/B 308M~~, B317~~**

~~**rod,**~~ ~~*, B 317/B 317M*~~

rod, *n*—~~solid wrought product that is long in relation to its circular cross section, which is 0.375 in. or greater [over 10.00 mm] in diameter.~~ —solid wrought product of circular cross section that is long in relation to its diameter, typically supplied in straight length

NOTE 1: In North America, the minimum diameter of a rod is 0.375 in. (or >10 mm); below this limit, the product is called "wire".

NOTE 2: In Europe, a rod is supplied in straight length; if supplied in coiled form, the product is called "wire".

NOTE 3: In Europe, a rod is often called "round bar". **B 107/B 107M, B 211, B 316/B 316M, B 666/B 666M**

cold-finished rod, n—rod brought to final dimensions by cold working to obtain improved surface finish and dimensional tolerances. **B 211**

cold-heading rod, n—rod of a quality suitable for use in the manufacture of cold-headed products such as bolts and rivets. **B 316/B 316M**

extruded rod, n—~~rod produced by hot extruding.~~ —rod brought to final dimensions by extruding. **B 107/B 107M, B 221~~, B317~~ , B 317/B 317M**

rivet rod, n— See *cold-heading rod.* **B 316/B 316M ~~shape,~~**

shape, *n*— this term is no longer recommended; the term **profile** is preferred. ~~sheet,~~

sheet, *n*—~~rolled wrought product that is rectangular in cross section, with thickness 0.006 in. and greater [over 0.15 mm] but less than 0.250 in. [up through 6.30 mm], and with sheared, slit, or sawed edges.~~ **~~B90/B90M, B209~~— rolled product that is rectangular in cross section with nominal thickness less than 0.250 in. (outside the USA less than 6 mm) but greater**