Standard Terminology Relating to Non-ferrous Metals and Alloys

This standard is issued under the fixed designation B899; 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.

1. Scope*

1.1 To promote precise understanding and interpretation of standards, reports, and other technical writings promulgated by Committee B02.

1.2 To standardize the terminology used in these documents.

1.3 To explain the meanings of technical terms used within these documents for those not conversant with them.

2. Referenced Documents

2.1 ASTM Standards:

B6 Specification for Zinc
B29 Specification for Refined Lead
B32 Specification for Solder Metal
B39 Specification for Nickel
B69 Specification for Rolled Zinc
B86 Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings
B160 Specification for Nickel Rod and Bar
B161 Specification for Nickel Seamless Pipe and Tube
B163 Specification for Seamless Nickel and Nickel Alloy Condenser and Heat-Exchanger Tubes
B164 Specification for Nickel-Copper Alloy Rod, Bar, and Wire
B165 Specification for Nickel-Copper Alloy (UNS N04400) Seamless Pipe and Tube
B166 Specification for Nickel-Chromium-Iron Alloys (UNS N06600, N06601, N06603, N06690, N06693, N06025, N06045, and N06696), Nickel-Chromium-Cobalt-Molybdenum Alloy (UNS N06617), and Nickel-Chromium-Tungsten Alloy (UNS N06674) Rod, Bar, and Wire
B240 Specification for Zinc and Zinc-Aluminum (ZA) Alloys in Ingot Form for Foundry and Die Castings
B327 Specification for Master Alloys Used in Making Zinc Die Casting Alloys
B333 Specification for Nickel-Molybdenum Alloy Plate, Sheet, and Strip
B339 Specification for Pig Tin
B408 Specification for Nickel-Iron-Chromium Alloy Rod and Bar
B418 Specification for Cast and Wrought Galvanic Zinc Anodes
B423 Specification for Nickel-Iron-Chromium-Molybdenum-Copper Lloy (UNS N08825, N08221, and N06845) Seamless Pipe and Tube
B425 Specification for Ni-Fe-Cr-Mo-Cu Alloy (UNS N08825, UNS N08221, and UNS N06845) Rod and Bar
B435 Specification for UNS N06002, UNS N06230, UNS N12160, and UNS R30556 Plate, Sheet, and Strip
B444 Specification for Nickel-Chromium-Molybdenum-Columbium Alloys (UNS N06625 and UNS N06852) and Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219) Pipe and Tube
B446 Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625), Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219), and Nickel-Chromium-Molybdenum-Tungsten Alloy (UNS N06650) Rod and Bar
B463 Specification for UNS N08020 Alloy Plate, Sheet, and Strip

*This terminology is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.91 on Editorial and Terminology.


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.

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B471 Specification for UNS N08020, UNS N08026, and UNS N08024 Nickel Alloy Spring Wire (Withdrawn 1999)
B473 Specification for UNS N08020, UNS N08024, and UNS N08026 Nickel Alloy Bar and Wire
B475 Specification for UNS N08020, UNS N08024, and UNS N08026 Nickel Alloy Round Weaving Wire
B511 Specification for Nickel-Iron-Chromium-Silicon Alloy Bars and Shapes
B512 Specification for Nickel-Chromium-Silicon Alloy (UNS N08330) Billets and Bars
B522 Specification for Gold-Silver-Platinum Electrical Contact Alloy
B536 Specification for Nickel-Iron-Chromium-Silicon Alloys (UNS N08330 and N08332) Plate, Sheet, and Strip
B540 Specification for Palladium Electrical Contact Alloy
B541 Specification for Gold Electrical Contact Alloy
B582 Specification for Nickel-Chromium-Iron-Molybdenum-Copper Alloy Plate, Sheet, and Strip
B622 Specification for Seamless Nickel and Nickel-Cobalt Alloy Pipe and Tube
B625 Specification for UNS N08925, UNS N08301, UNS N08932, UNS N08926, UNS N08354, and UNS R20033 Plate, Sheet, and Strip
B637 Specification for Precipitation-Hardening and Cold Worked Nickel Alloy Bars, Forgings, and Forging Stock for Moderate or High Temperature Service
B639 Specification for Precipitation Hardening Cobalt-Containing Alloys (UNS R30155 and UNS R30816) Rod, Bar, Forgings, and Forging Stock for High-Temperature Service
B649 Specification for Ni-Fe-Cr-Mo-Cu-N Low-Carbon Alloys (UNS N08925, UNS N08031, UNS N08354, and UNS N08926), and Cr-Ni-Fe-N Low-Carbon Alloy (UNS R20033) Bar and Wire, and Ni-Cr-Fe-Mo-N Alloy (UNS N08936) Wire
B667 Practice for Construction and Use of a Probe for Measuring Electrical Contact Resistance
3. Significance and Use

3.1 The terms defined in this document are generic in respect to the standards under the jurisdiction of Committee B02 on Nonferrous Metals and Alloys. The same terms may have different definitions in other ASTM technical committees.

3.2 Some definitions may differ within the committee because of limitations on items such as weights or dimensions. In such cases the terms will be more precisely defined in the Terminology section of the standards in which these terms are used.

4. Index of Terms

4.1 Alphabetical Listing of Terms

average diameter
bar
billet
can
cathodic protection
coast alloy
coiled sheet
compact
contact resistance
contact resistance probe
die casting
fill pin
fineness
flat sheet
foundry casting
galvanic anode
graphite permanent mold casting
heat
ingot
liquidus
lot
lot number
melt
nickel
nickel alloy
nickel-base alloy
nickel-based alloy
nominal wall
part
permanent mold casting
pig
pipe
plate
platinum group metal
powder
powder blend
precious metals
precipitation hardening
pressure die-casting
producer
rod
rough part
saline electrolyte
sand casting
seamless pipe
semi-permanent mold casting
shapes
sheet
shot
solidus
sponge
spring wire
strip
test report
thin-wall tube
tube
weaving wire
welded pipe
wire

5. Terminology

5.1 Terms and Their Definitions

average diameter, \( n \)—the average of the maximum and minimum outside the diameters, as determined at any one section of the pipe or tube. B160, B161, B163, B165, B167, B407, B423, B444, B445, B535, B622, B677, B690, B710, B722, B723, B726, B729, B739, B751, B759, B775

bar, \( n \)—an elongated, forged or rolled metal product with uniform strength, length and section (such as rectangular, square, round, oval or hexagonal). B327, B518

brightener bar, \( n \)—brightener bar is a zinc alloy containing aluminum which is added to the galvanizing bath to adjust the aluminum content of the bath to: suppress the formation of iron-zinc alloy layers, increase the brightness and ductility of the galvanized coating, and improve the drainage of zinc from the work as it exits the bath; also called brightener. B860

can, \( n \)—the container used to encapsulate the powder during the pressure consolidation process; it is removed from the final part. B834
cathodic protection, *n*—protection of a metal from corrosion by making it a cathode through the galvanic sacrifice of a less noble metal or through an impressed electric current. B418

coast alloy, *n*—a material that conforms to a specification that requires, by weight percent, more cobalt than any other element.

coiled sheet, *n*—sheet in coils with slit edges. B69

compact, *n*—the consolidated powder from one can; it may be used to make one or more parts. B834

contact resistance, *n*—the resistance to current flow between two touching bodies, consisting of constriction resistance and film resistance. B667

contact resistance probe, *n*—an apparatus for determining electrical contact resistance characteristics of a metal surface.

Discussion—Probe, in this instance, should be distinguished from the classical tool whose function it is to touch or move an object. B667

die casting, *n*—a casting process in which molten metal is injected under high velocity and pressure into a metal die and solidified; also, a product produced by such a process. Alternately known as pressure die casting. B6, B240, B892, B894

fill pin, *n*—the part of the compact in the spout used to fill the can; it is usually integral to the part produced. B834

fineness, *n*—a measure of the purity of precious metals expressed in parts per thousand.

flat sheet, *n*—sheet with sheared, silt, or sawed edges that has been flattened or leveled. B69

foundry casting, *n*—a casting process wherein a molten metal is poured by gravity into the cavity of a mold and solidified; also, a product produced by such a process.

Discussion—Beginning in 1992, only alloys containing nickel as the principal constituent have been categorized as a nickel alloy for the purpose of new coverage in B02 specifications. Prior to 1992, nickel alloys were defined as alloys nominally containing less than 50 % iron with nickel as the highest nonferrous element present.

nickel-base alloy and nickel-based alloy—these terms are not used in ASTM standards under the jurisdiction of Committee B02 and are not preferred. See nickel alloy.

nominal wall, *n*—specified wall thickness with a published plus and minus tolerance from the specified thickness at any point. B535, B710, B722, B723, B726, B739, B751, B775

part, *n*—a single item coming from a compact, either prior to or after machining. B834

permanent mold casting, *n*—a metal object 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. See graphite permanent mold casting. B86, B792

pig, *n*—an oblong or square mass of metal that has been cast while still molten into a mold that gives the metal its particular shape; most commonly used for lead and tin in weights that can be handled manually. B29, B339

pipe, *n*—a tubular metal product, cast or wrought, of dimensions that conform to those referred to commercially as standard pipe sizes. B161, B165, B167, B407, B423, B444, B445, B535, B622, B677, B690, B710, B722, B723, B729, B759, B775

plate, *n*—a flat-rolled metal product of same minimum thickness and width arbitrarily dependent on the type of metal. B44, B476, B535, B690, B710, B722, B723, B729, B759, B775

platinum group metal, *n*—these metals are palladium, platinum, rhodium, iridium, osmium, and ruthenium. B522, B540, B541

powder, *n*—particles of a solid characterized by small size, nominally within the range of from 0.1 to 1000 u.m.

Discussion—Beginning in 1992, only alloys containing nickel as the principal constituent have been categorized as a nickel alloy for the purpose of new coverage in B02 specifications. Prior to 1992, nickel alloys were defined as alloys nominally containing less than 50 % iron with nickel as the highest nonferrous element present.

powder blend, *n*—a homogeneous mixture of powder from one or more heats; it is limited to the amount that can be mixed in the same blender at one time. B834
precious metals, \( n \)—the eight noble metals: gold, silver, palladium, platinum, rhodium, iridium, osmium, and ruthenium.

precipitation hardening, \( n \)—hardening caused by the precipitation of a constituent from a supersaturated solid solution.

pressure die-casting, \( n \)—Same as die casting.  B86, B791

producer, \( n \)—the primary manufacturer of the material.  B32

rod, \( n \)—wrought material of round, solid straight lengths.  B408, B518, B691

NOTE 2—In the following standards the term “rod” has a similar definition, but is worded differently.  B160, B164, B166, B425, B446, B637, B639, B756

rough part, \( n \)—the part prior to final machining.  B834

saline electrolyte, \( n \)—a solution customarily consisting of the chlorides of the alkali metals.  B418

sand casting, \( n \)—a casting process wherein molten metal is poured by gravity into the cavity of a sand mold and solidified; also, a product of such a process.  B791

seamless pipe, \( n \)—a round, hollow product made with a continuous periphery in all stages of manufacture and produced to the particular dimensions commercially known as standard pipe sizes.  B423, B444, B775

semi-permanent mold casting, \( n \)—mold casting that is made with an expendable core such as sand.  B791

shapes, \( n \)—materials of solid section in such forms as angles, channels, tees, I-beams, and four-fluted bars.  B511

sheet, \( n \)—a flat-rolled metal product of some maximum thickness and minimum width arbitrarily dependent on the type of metal; it is thinner than plate.  B69, B463, B599, B625, B688, B709, B718, B749

shot, \( n \)—small spherically shaped particles of metal.  B327

solidus, \( n \)—the highest temperature at which under equilibrium conditions an alloy begins to melt on heating or is completely solid on cooling.

sponge, \( n \)—a form of metal characterized by a porous condition that is the result of decomposition or reduction of a compound without fusion.

spring wire, \( n \)—round wire intended especially for the manufacture of springs.  B471

strip, \( n \)—a flat-rolled metal product of some maximum thickness and width arbitrarily dependent on the type of metal, it is narrower than sheet.  B463, B536, B599, B625, B688, B709, B718, B749

test report, \( n \)—a document that presents the applicable qualitative or quantitative results obtained by applying one or more given test methods.

DISCUSSION—A single document, containing test report information and certificate of compliance information, may be used.

thin-wall tube, \( n \)—tube with specified wall thickness 3 % or less of the specified outside diameter.  B751

tube, \( n \)—a hollow product of round or any other cross section having a continuous periphery of uniform shape.  B423, B444, B445, B535, B677, B722, B729

NOTE 3—The following standards use the same definition for “tube,” less the words “of uniform shape.”  B161, B163, B165, B167, B407, B622, B690, B759

weaving wire, \( n \)—round wire intended especially for weaving.  B475

welded pipe, \( n \)—a round hollow product made by forming flat stock and joining the single longitudinal seam by welding; it is produced to the particular dimensions commercially known as standard pipe sizes.  B775

wire, \( n \)—a thin, flexible continuous length of metal, usually of uniform, round cross section.  B473, B649, B672, B691, B805

6. Index of Terms Specific to a Standard

6.1 Terms and Their Corresponding Standard(s)

bars — B473, B649, B672
billet — B512
High Grade — B6
jumbo ingot — B897
mischmetal — B750
Prime Western — B6
Special High Grade — B6
ribbon anode — B69, B418
wire — B164, B166

7. Abbreviations

7.1 Abbreviations

CGG—continuous galvanizing grade zinc
HG—High Grade Zinc
MM—mischmetal
PW—Prime Western Zinc
SHG—Special High Grade Zinc
UNS—Unified Numbering System
V—12—zinc-12 % aluminum master alloy used to produce die casting alloy #3
ZA—zinc-aluminum
ZA—8—zinc- 8 % aluminum- 1 % copper die casting alloy
ZA—12—zinc- 11 % aluminum- 1 % copper die casting and foundry alloy
ZA—27—zinc- 27 % aluminum- 2 % copper die casting and foundry alloy
Zn-5Al-MM—zinc- 5 % aluminum-mischmetal galvanizing alloy
85 Zn/15 aluminum—85 % zinc- 15 % aluminum alloy
95/5 Zn/Al—95 % zinc- 5 % aluminum alloy
90/10 Zn/Al—90 % zinc- 10 % aluminum alloy
90/10 Al/Sb—90 % zinc- 10 % antimony alloy

8. Index of Keywords Used in B02 Standards

8.1 Index of Keywords

alloys
aluminum-base master alloy
aluminum alloy hardener
analysis
antimony
babbit metal
bar
bearing alloys
billet
bismuth
blanking dies
block
brightener
cake
casting
casting alloys
cathodic protection
certification
CGG alloy
chemical-copper lead
chemical analysis
chemical composition
chemical requirements
cobalt alloys
cold worked
color
color code
compact
continuous galvanizing grade zinc
definitions
die casting alloys
die castings
fittings
flux
flux cored solder
forsings
forming dies
foundry alloys
foundry castings
freezing point
fuses
fusible alloys
fusion-welded pipe
fusion welded
galvanic anodes
grades
grain size
gravity casting
high-temperature alloy
high grade zinc
hug
hot-dip coating alloy
hot chamber die castings
hot finished
indium
ingot
iron-nickel-chromium-molybdenum
joining
jumbo ingot
9. **Keywords**

9.1 definitions; nonferrous metals; terminology
Committee B02 has identified the location of selected changes to this standard since the last issue (B899 – 09ε1) that may impact the use of this standard. (Approved February 1, 2013.)

(1) Added definition for cobalt alloy.

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