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Standard Terminology Relating to Non-ferrous Metals and Alloys¹

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.

1.4 Some definitions include a *discussion* section, which is a mandatory *part* of the definition and contains additional information that is relevant to the meaning of the defined term.

1.5 Definitions of terms specific to a particular standard will appear in that standard and will supersede any definitions of identical terms in this standard.

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. Significance and Use

2.1 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.

2.2 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.

¹ 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 Terminology.

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3. Terminology

General Nonferrous Metals and Alloys

3.1 *Terms and Their Definitions:*

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

DISCUSSION—The term “bar” may have a similar definition, but with greater and more specific detail in the product standard.

billet, *n*—a formed shape that may be further worked, or a solid, semifinished, round, or rectangular product that has been hot-worked by forging, rolling, or extrusion.

ellipsis, *n*—in a tabular entry, three periods (...) that indicate that there is no requirement.

heat, *n*—refer to **melt**.

ingot, *n*—a casting of simple shape suitable for hot-working or remelting.

liquidus, *n*—the lowest temperature at which an alloy under equilibrium conditions begins to freeze on cooling or is completely melted on heating.

lot, *n*—a quantity of metal made under conditions that, for sampling purposes, are considered uniform.

lot number, *n*—a unique alphanumeric designation for a lot that is traceable to manufacturing records.

melt, *n*—all the metal that, while molten, was held at the same time in the same holding vessel.

nonferrous material, *n*—metals and alloys that do not contain iron as the principal component.

DISCUSSION—The iron content is not always stated in the specification and is not always determined by chemical analysis. The iron content may be taken to be 100 % minus the sum of the mean values permitted by the specification for all other elements having a specified range or a specified maximum. For conformance purposes, the mean value for iron, whether specified or calculated, is compared on an individual basis to the mean values permitted by the specification for each of the other elements having a specified range or a specified maximum. If an element other than iron is not specified, but is listed as remainder or balance, then, for conformance purposes the mean value for iron is compared to the calculated value for that other element.

plate, *n*—a flat-rolled metal product of same minimum thickness and width arbitrarily dependent on the type of metal.

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

producer, n—the primary manufacturer of the material.

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.

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.

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.

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.

wire, n—a thin, flexible continuous length of metal, usually of uniform, round cross section.

Refined Lead, Tin, Antimony, and Their Alloys

3.2 Terms and Their Definitions:

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.

Zinc and Cadmium

3.3 Terms and Their Definitions:

alloy composition, n—the composition is identified by a two or four-letter symbol and number. The letters typically indicate the chemical symbol for the critical element in the solder and the number indicates the nominal percentage, by weight, of the critical element in the solder.

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.

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.

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

color code, n—code to follow the quick identification of ingots.

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.

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

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 of such a process.

galvanic anode, n—a metal electrode that sacrificially corrodes when coupled to a more noble metal in a conducting medium, thereby supplying a protective electric current to the more noble electrode.

graphite permanent mold casting, n—a metal object produced by introducing molten metal by gravity or low pressure into a graphite mold and allowing it to solidify.

hardener, n—an aluminum-base master alloy added to Special High Grade Zinc (SHG) to produce a zinc alloy for die casting.

high fluidity alloy, n—a zinc alloy by nature of its composition is capable of producing die castings with thinner wall sections compared to typical die cast alloys, often less than 0.012 in. (0.30 mm) in thickness.

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 also graphite permanent mold casting.

pressure die-casting, n—same as die casting.

ribbon anode, n—a long, continuous sacrificial anode shape, with a diamond, square, rectangular, oval, or other cross-section, most commonly made of zinc, magnesium or aluminum, having a core wire normally made of steel, that is, usually supplied in coils or reels of 100 to 3600 ft depending upon size and cross-section.

saline electrolyte, n—a solution customarily consisting of the chlorides of the alkali metals.

shot, n—small spherically shaped particles of metal.

spin casting, n—a casting process in which molten metal is poured into a rubber, polymer, graphite or metal mold and spun centrifugally until solidified, also a product produced by such a process.

type 5, n—95 % zinc-5 % aluminum.

type 10, n—90 % zinc-10 % aluminum.

type 15, n—85 % zinc-15 % aluminum.

3.4 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.

85/15 Zn/Al—85 % zinc-5 % 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.

Precious Metals and Electrical Contact Materials

3.5 Terms and Their Definitions:

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

precious metals, *n*—the eight noble metals: gold, silver, palladium, platinum, rhodium, iridium, osmium, and ruthenium.

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

Refined Nickel and Cobalt and Their Alloys

3.6 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.

can, *n*—the container used to encapsulate the powder during the pressure consolidation process; it is removed from the final part.

cobalt alloy, *n*—a material that conforms to a specification that contains cobalt as the principal component.

DISCUSSION—The cobalt content requirement is not always stated in the specification and is not always determined by chemical analysis. If not specified, it may be taken to be 100 % minus the sum of the mean values permitted by the specification for all other elements having a specified range or a specified maximum. For conformance purposes, the mean value for cobalt, whether if specified, or the calculated value for cobalt, is compared on an individual basis to the mean values permitted by the specification for each of the other elements having a specified range or a specified maximum. If an element other than cobalt is not specified, but is listed as remainder or balance, then, for conformance purposes the mean value for cobalt is compared to the calculated value for that other element.

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

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

nickel, *n*—a refined nickel primarily produced from ore or matte or similar raw material containing a minimum of 99.80 percent nickel by weight.

nickel alloy, *n*—a material that contains nickel as the principal component.

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. The nickel content requirement is not always stated in the specification and is not always determined by chemical analysis. If not specified, it may be taken to be 100 % minus the sum of the mean values permitted by the specification for all other elements having a specified range or a specified maximum. For conformance purposes, the mean value for nickel, whether specified or calculated, is compared on an individual basis to the mean values permitted by the specification for each of the other elements having a specified range or a specified maximum. If an element other than nickel is not specified, but is listed as remainder or balance, then, for conformance purposes the mean value for nickel is compared to the calculated value for that other element.

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.

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

pipe, *n*—a tubular metal product, cast or wrought, of dimensions that conform to those referred to commercially as standard pipe sizes.

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

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.

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

rod, *n*—wrought material of round, solid straight lengths.

DISCUSSION—The term “rod” may have a similar definition, but can be worded differently in the product standard.

rough part, *n*—the part prior to final machining.

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.

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

spring wire, *n*—round wire intended especially for the manufacture of springs.

thin-wall tube, *n*—tube with specified wall thickness 3 % or less of the specified outside diameter.