



Designation: **B592**—~~11~~ **B592** – 15

Standard Specification for Copper-Zinc-Aluminum-Cobalt Alloy, Copper-Zinc-Tin-Iron Alloy Plate, Sheet, Strip, and Rolled Bar¹

This standard is issued under the fixed designation B592; 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 This specification ~~overse~~ establishes the requirements for Copper Alloy UNS C66300 and C68800 plate, sheet, strip, and rolled bar in alloys C66300 and C68800.²

NOTE 1—Since alloy C68800 is frequently used in a variety of applications where yield strength and stress-corrosion resistance may be critical, it is recommended that drawings or samples of the part to be fabricated and details of application be submitted for use in establishing temper and treatment of material.

NOTE 2—Alloy C66300 is covered by a patent. Interested parties are invited to submit information regarding the identification of an alternative(s) to this patented item to the ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

1.2 Units—The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI ~~units that~~ units, which are provided for information only and are not considered standard.

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:

2.1 *ASTM Standards*:³

[B193 Test Method for Resistivity of Electrical Conductor Materials](#)

[B248 Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar](#)

[B601 Classification for Temper Designations for Copper and Copper Alloys—Wrought and Cast](#)

[B846 Terminology for Copper and Copper Alloys](#)

[E8E8/E8M Test Methods for Tension Testing of Metallic Materials](#)

[E18 Test Methods for Rockwell Hardness of Metallic Materials](#)

[E54 Test Methods for Chemical Analysis of Special Brasses and Bronzes \(Withdrawn 2002\)](#)⁴

[E75 Test Methods for Chemical Analysis of Copper-Nickel and Copper-Nickel-Zinc Alloys \(Withdrawn 2010\)](#)⁴

[E76 Test Methods for Chemical Analysis of Nickel-Copper Alloys \(Withdrawn 2003\)](#)⁴

[E112 Test Methods for Determining Average Grain Size](#)

[E255 Practice for Sampling Copper and Copper Alloys for the Determination of Chemical Composition](#)

[E478 Test Methods for Chemical Analysis of Copper Alloys](#)

[E527 Practice for Numbering Metals and Alloys in the Unified Numbering System \(UNS\)](#)

3. General Requirements

3.1 The following sections of Specification [B248](#) constitute a part of this specification:

3.1.1 ~~Terminology—Definitions, Terminology,~~

3.1.2 ~~Material~~ Materials and Manufacture,

¹ This specification is under the jurisdiction of ASTM Committee B05 on Copper and Copper Alloys and is the direct responsibility of Subcommittee B05.01 on Plate, Sheet, and Strip.

Current edition approved Oct. 1, 2015. Published November 2015. Originally approved in 1973. Last previous edition approved in 2006 as [B592-01B592 \(2006\)](#), ~~11~~. DOI: 10.1520/B0592-11.10.1520/B0592-15.

² 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.

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.

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

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

- 3.1.3 Workmanship, Finish, and Appearance,
- 3.1.4 Sampling, except for chemical analysis,
- 3.1.5 Number of Tests and Retests,
- 3.1.6 Specimen Preparation,
- 3.1.7 Test Methods, ~~except for chemical analysis,~~
- 3.1.8 Significance of Numerical Limits,
- 3.1.9 Inspection,
- 3.1.10 Rejection and Rehearing,
- 3.1.11 Certification,
- 3.1.12 Test Reports (Mill), Reports,
- 3.1.13 Packaging and Package Marking, and
- 3.1.14 Supplementary Requirements.

3.2 In addition, when a section with a title identical to that referenced in 3.1, above, appears in this specification, it contains additional requirements which supplement those appearing in Specification **B248**.

4. Terminology

4.1 ~~Definitions~~—For definitions of terms ~~used in this specification, related to copper and copper alloy,~~ refer to Terminology **B846**.

5. Ordering Information

5.1 ~~Contracts or purchase~~ Include the following specified choices when placing orders for product under this specification should include the following information: specification, as applicable:

- 5.1.1 ~~ASTM designation and year of issue (for example, issue, B592 – XX);~~
- 5.1.2 ~~Copper Alloy [Alloy] UNS No. designation (for example, C68800); designation,~~
- 5.1.3 ~~Temper (see Section (Section 8),~~
- 5.1.4 ~~Dimensions, that is, thickness, width, length, and so forth. (see Section edges (Section 13),~~
- 5.1.5 ~~Form, that is, plate, sheet, strip, or rolled bar,~~
- 5.1.5 How furnished, that is, coils, specific lengths or stock lengths, with or without ends, furnished: straight lengths or coils,
- 5.1.6 Quantity, that is, total weight each form, temper, and Quantity total weight or total length or number of pieces of each size, and
- 5.1.7 ~~Whether material is purchased for agencies of the U.S. government (see Section Intended application. 12).~~

5.2 ~~The following options are available under this specification and should be specified in the contract or purchase but may not be included unless specified at the time of placing of the order when required:~~

- 5.2.1 Heat identification or traceability details,
- 5.2.2 Certification,
- 5.2.3 Mill Test Report,
- 5.2.4 Type of edge, that is, slit, if required, (slit, sheared, sawed, square corners, round corners, rounded edges, or full rounded edges, and edges),
- 5.2.5 Width Type of width and straightness tolerances (see Section tolerances, if required (Section 13).),
- 5.2.6 If product is purchased for agencies of the U.S. Government (see Supplementary Requirements section of Specification **B248** for additional requirements).

6. ~~Material~~ Materials and Manufacture

6.1 ~~Material:~~ Materials:

6.1.1 ~~The material of manufacture shall be a cast form (cast bar, cake, slab, and so forth, et cetera) of Copper Alloy UNS No. C66300 or C68800 of such purity and soundness as to be suitable for process in to processing into the products prescribed herein.~~

6.1.2 ~~In the event~~ When specified in the contract or purchase order that heat identification or traceability is required, the purchaser shall specify the details desired.

NOTE 3—Due to the discontinuous nature of the processing of castings into wrought products, it is not always practical to identify a specific casting analysis with a specific quantity of finished material.

6.2 Manufacture:

6.2.1 The product shall be manufactured by such hot working, cold working, and annealing processes as to produce a uniform wrought structure in the finished product.

6.2.2 The product shall be hot- or cold-worked to the finished size and subsequently annealed, when required, to meet the temper properties specified.

6.2.3 ~~Edges~~—~~Slit edges shall be furnished unless otherwise specified in the contract or purchase order.~~

6.3 Edges:

6.3.1 Slit edges shall be furnished unless otherwise specified in the contract or purchase order.

7. Chemical Composition

7.1 The material shall conform to the chemical composition requirements specified in **Table 1**.

7.2 These composition limits do not preclude the presence of other elements. ~~Limits~~ By arrangement between the manufacturer and purchaser, limits may be established and analysis required for unnamed elements by agreement between the manufacturer and the purchaser. ~~elements.~~

7.3 For alloys in which copper is listed as “remainder,” copper is the difference between the sum of results of all elements determined and 100 %. When all elements in **Table 1** are determined, the sum of the results shall equal at least 99.5 %.

7.4 For alloys in which ~~copper~~zinc is listed as “~~Remainder,~~” copper is “remainder,” either copper or zinc may be taken as the difference between the sum of results of all other elements determined and 100 %. When all elements in **Table 1** are determined, the sum of the results shall equal at least 99.5 %.

8. Temper

8.1 ~~Products fabricated from these alloys are available in the tempers listed~~ The standard tempers for products described in this specification are given in **Table 2** as defined in Classification **B601**.

8.1.1 ~~Rolled (H)~~—The standard tempers for rolled material are as designated in Cold-rolled tempers H01 to H14. **Table 2** with the prefix “H”. Former designations and the standard designations as defined in Classification **B601** are shown.

8.1.2 ~~Anneal to Temper (O)~~—The standard tempers of annealed-to-temper material are as designated in Annealed-to-temper O61 **Table 2** with the prefix “O”. Former designations and the standard designations as defined in Classification and O82. **B601** are shown.

9. Grain Size for Annealed Tempers

9.1 Although no grain size range has been established, the product must be fully recrystallized as determined by Test Method ~~Methods~~ **E112**.

10. Physical Property Requirements

10.1 The electrical resistivity requirement of Copper Alloys UNS C66300 and UNS C68800 are listed in **Table 3** for information only. Electrical Resistivity Requirement:

10.1.1 When specified in the contract or purchase order, the product furnished shall conform to the electrical mass resistivity requirement prescribed in **Table 3**, when tested in accordance with Test Method **B193**.

TABLE 1 Chemical Requirements

Element	Composition, %%		Element	Composition, %%	
	Copper Alloy UNS No.			Copper Alloy UNS No.	
	C68800			C66300	
Copper, incl silver	remainder		Copper, incl silver	84.5–87.5	
Aluminum	3.0–3.8		Aluminum	...	
Zinc	21.3–24.1		Zinc	remainder	
Zinc + aluminum	25.1–27.1		Zinc + aluminum	...	
Cobalt	0.25–0.55		Cobalt	0.20 max	
Nickel	...		Nickel	...	
Lead	0.05 max		Lead	0.05 max	
Iron	0.20 max		Iron	...	
			Iron + Cobalt	1.4–2.4	
			Tin	1.5–3.0	
			Phos	.35 max	
			Phos	0.35 max	