



Designation: **B569—14 B569 – 19**

Standard Specification for Brass Strip in Narrow Widths and Light Gage for Heat- Exchanger Tubing¹

This standard is issued under the fixed designation B569; 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 establishes the requirements for brass strip in narrow widths and light gages produced from Copper Alloys Nos. C23000, C26000, and C26130.²

NOTE 1—This product is commonly used for the manufacture of thin-wall tubes for water passages in heat exchangers for internal combustion engines and other ~~closed-system~~ closed-system heat sources.

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, which are provided for information only and are not considered standard.

1.2.1 *Exception*—Grain size and chemical analysis sampling are stated in SI units.

1.3 *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 *ASTM Standards:*³

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

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

~~[B950 Guide for Editorial Procedures and Form of Product Specifications for Copper and Copper Alloys](#)~~

[E3 Guide for Preparation of Metallographic Specimens](#)

[E8/E8M Test Methods for Tension Testing of Metallic Materials](#)

[E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications](#)

[E62 Test Methods for Chemical Analysis of Copper and Copper Alloys \(Photometric Methods\) \(Withdrawn 2010\)](#)⁴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. Terminology

3.1 For definitions of terms related to copper and copper alloys, refer to Terminology [B846](#).

4. Ordering Information

4.1 Include the following specified choices when placing orders for products under this specification, as applicable:

4.1.1 ASTM designation and year of issue (for example, ~~B569—XX~~);

4.1.2 Copper [Alloy] UNS No. designation (for example, ~~C26000~~);

4.1.3 Temper (Section 7);

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 Sept. 1, 2014/April 1, 2019. Published November 2014/April 2019. Originally approved in 1972. Last previous edition approved in 2009/2014 as B569—09/B569—14. DOI: 10.1520/B0569-14.10.1520/B0569-19.

² The UNS system for copper and copper alloys (see Practice E527) is a simple expansion of the former standard designation system accomplished by the addition of a prefix “C” and a suffix “00.” The suffix can be used to accommodate composition variations of the base alloy.

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

- 4.1.4 Dimensions: thickness, width, length (Section 10); and
- 4.1.5 Quantity: total weight each form, temper, and size.

4.2 The following options are available but may not be included unless specified at the time of placing of the order when required:

- 4.2.1 Heat identification or traceability details,
- 4.2.2 Certification, and
- 4.2.3 ~~Mill test report.~~ Test Report.

5. Materials and Manufacture

5.1 Material:

5.1.1 The material of manufacture shall be a form (cast bar, cake, or slab) of Copper Alloy UNS No. C23000, C26000, or C26130 of such purity and soundness as to be suitable for processing into the products prescribed herein.

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

NOTE 2—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.

5.2 Manufacture:

5.2.1 The product width shall be no greater than 3 in. (76.2 mm), and thickness shall be less than 0.0181 in. (0.460 mm).

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

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

5.2.3 Edges:

5.2.3.1 Slit edges shall be furnished.

6. Chemical Composition

6.1 The material shall conform to the chemical compositional requirements in **Table 1** for Copper Alloy UNS No. designation specified in the ordering information.

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

6.2 For alloys in which zinc is listed as “remainder,” copper or zinc is taken as the difference between the sum results of all elements determined and 100 %.

6.3 When all elements listed in **Table 1** are determined for C26000 and C26130 the sum of results shall be 99.7 % min and for C23000 the sum of results shall be 99.8 % min.

7. Temper

7.1 The standard tempers for products described in this specification are given in **Table 2** and **Table 3** as defined in Classification **B601**.

7.1.1 Cold rolled tempers H01 or H02.

7.1.2 Annealed-to-temper O81 or O82.

NOTE 3—The purchaser should confer with the manufacturer or supplier for the availability of product in a specific temper.

8. Grain Size of Annealed Tempers

8.1 ~~Annealed-to-Temper~~ Annealed-to-temper (O81 and O82) strip shall have an average grain size of 0.015 mm maximum as determined by Test Methods **E112**.

TABLE 1 Chemical Requirements

Copper Alloy UNS No.	Composition, %				
	Copper	Lead, max	Iron, max	Arsenic	Zinc
C23000	84.0–86.0 ^A	0.05	0.05	...	Remainder
C26000	68.5–71.5 ^B	0.07	0.05	...	Remainder
C26130	68.5–71.5 ^B	0.05	0.05	0.02–0.08	Remainder

^A Cu + Sum of Named Elements = 99.8 %.

^B Cu + Sum of Named Elements = 99.7 %.

TABLE 2 Tensile Strength, Yield Strength, and Elongation Requirements for Rolled-to-Temper Material

Copper Alloy UNS No.	Temper Designation	Tensile Strength, ksi (MPa ^A)				Yield Strength, ksi (MPa ^A)				% Elongation In 2 in. (50 mm) Minimum
		Code	Name	Minimum	Maximum	At 0.5 % Extension Under Load		At 0.2 % Offset		
						Minimum	Maximum	Minimum	Maximum	
C23000	H01	¼ Hard	44 (305)	54 (370)	25 (170)	48 (330)	23 (160)	48 (330)	18	
C26000 and C26130	H01	¼ Hard	49 (340)	59 (405)	33 (230)	48 (330)	30 (205)	45 (205)	12	
C26000 and C26130	H02	½ Hard	58 (400)	68 (470)	43 (295)	58 (400)	40 (275)	55 (380)	10	

^A See Appendix X1.

TABLE 3 Tensile Strength, Yield Strength, and Elongation Requirements for Annealed-to-Temper Material

Copper Alloy UNS No.	Temper Designation	Tensile Strength, ksi (MPa ^A)				Yield Strength, ksi (MPa ^A)				% Elongation In 2 in. (50 mm) Minimum
		Code	Minimum	Maximum	At 0.5 % Extension Under Load		At 0.2 % Offset			
					Minimum	Maximum	Minimum	Maximum		
C23000	O81	42 (210)	52 (360)	21 (145)	36 (250)	20 (140)	35 (240)	34		
C26000 and C26130	O82	60 (415)	70 (485)	35 (240)	50 (345)	34 (235)	49 (340)	25		

^A See Appendix X1.

9. Mechanical Property Requirement

9.1 Tensile Strength Requirement:

9.1.1 Product furnished to this specification shall conform to the tensile strength requirements prescribed in **Tables 2 and 3** for the temper and alloy specified in the ordering information when tested in accordance with Test Methods **E8/E8M**.

9.2 Yield Strength Requirement:

9.2.1 Product furnished to this specification shall be capable of conforming to the yield strength requirements prescribed in **Tables 2 and 3** for the temper and alloy specified in the ordering information when tested in accordance with Test Methods **E8/E8M**. The purchaser must specify at the time of ordering which yield strength method shall be used.

9.3 Elongation Test Requirement:

9.3.1 Product furnished to this specification shall conform to the elongation requirements prescribed in **Tables 2 and 3** for the temper and alloy specified in the ordering information when tested in accordance with Test Methods **E8/E8M**.

9.4 Acceptance or rejection based upon mechanical properties shall depend only on tensile strength and elongation.

10. Dimensions, Mass, and Permissible Variations

10.1 Unless closer tolerances are specified in the contract or purchase order, the product furnished shall conform to the following thickness and width tolerances:

10.1.1 *Thickness Tolerances*—**Table 4**.

10.1.2 *Width Tolerances*—**Table 5**.

10.2 *Straightness Tolerances*—The maximum edgewise curvature (depth of arc) in any ~~72-in. (1829 mm)~~ 72 in. (1829 mm) continuous length shall not exceed 1/8 in. (3.175 mm).

11. Workmanship, Finish, and Appearance

11.1 The strip shall be free of defects, but blemishes of a nature that do not interfere with normal commercial operations are acceptable. It shall be ~~well-cleaned~~ well cleaned and free of dirt. A superficial film of residual light lubricant may be present and is acceptable unless otherwise specified.

TABLE 4 Thickness Tolerances

Thickness, in. (mm)	Thickness Tolerance, ±in. (mm), ^{A,B} 3 in. (7.62 mm) and Under in Width
0.006 (0.152) and under	0.0003 (0.008)
Over 0.006 to 0.009 (0.152 to 0.229)	0.0004 (0.010)
Over 0.009 to 0.018 (0.229 to 0.457)	0.0005 (0.013)

^A When tolerances are specified as all plus or minus, double the values shown.

^B Some applications may require a closer tolerance control within any one coil even though the overall tolerance between coils or shipments can be to the tolerance shown. Such special tolerance requirements shall be negotiated between the manufacturer or supplier and the purchaser at the time the order is placed.