



Designation: B129 – 22

Standard Specification for Cartridge Brass Cartridge Case Cups ¹

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1. Scope*

1.1 This specification establishes the requirements for annealed cartridge brass cups produced of Copper Alloy UNS No. C26000 for processing into cartridge cases of the following types:

- 1.1.1 *Type I*, for small arms cartridge case cups, and
- 1.1.2 *Type II*, for artillery cartridge case cups.

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

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*:²
 - B601** Classification for Temper Designations for Copper and Copper Alloys—Wrought and Cast
 - B846** Terminology for Copper and Copper Alloys
 - E3** Guide for Preparation of Metallographic Specimens
 - E29** Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
 - 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

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.

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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.

3. Terminology

3.1 For definitions of terms related to copper and copper alloys, refer to Terminology **B846**.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *cup (cupping), n*—a shallow cylindrical shell closed at one end, normally intended for further fabrication, formed from a blank.

4. Ordering Information

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

- 4.1.1 ASTM designation and year of issue,
- 4.1.2 Type (Section 1),
- 4.1.3 Temper (Section 7),
- 4.1.4 Dimensions and tolerances (Section 9),
- 4.1.5 Drawing number to which order applies (Section 9).

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 Grain size analysis of the base (Section 14),
- 4.2.2 Source inspection (Section 16),
- 4.2.3 Certification,
- 4.2.4 Test Report, and
- 4.2.5 If product is purchased for agencies of the U.S. Government (see the Supplementary Requirements section of this specification for additional requirements, if specified).

5. Materials and Manufacture

5.1 *Materials*:

5.1.1 The material of manufacture shall be annealed plate, sheet, strip, or disks of wrought Copper Alloy UNS No. C26000 processed into the products prescribed herein.

5.2 *Manufacture*:

5.2.1 The product shall be manufactured by such blanking and cupping to meet the cup dimensions specified, and subsequently annealed. The annealed cups shall be finish, plain pickled, and dried.

6. Chemical Composition

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

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

TABLE 1 Chemical Requirements

Element	Copper Alloy UNS No. C26000	
	Composition, %	
Copper	68.5–71.5	
Lead, max	0.07	
Iron, max	0.05	
Bismuth, max	0.006	
Zinc	remainder	

6.2 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

6.3 Because zinc is listed as “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 results shall be 99.7 % min.

7. Temper

7.1 The standard tempers for products described in this specification are given in **Table 2**.

7.1.1 Annealed tempers OS080 and OS110.

8. Grain Size for Annealed Tempers

8.1 Grain size shall be the standard requirement for all product in the annealed tempers.

8.1.1 Unless there is a prior agreement between the purchaser and supplier, the grain size for 0.30, 0.45, and 0.50 calibers will be produced to the grain size requirements specified in **Table 2**.

8.1.2 Grain size ranges other than those specified in **Table 2** shall be established by agreement between the manufacturer and purchaser.

8.1.3 Grain size ranges for other cups shall be established by agreement between the manufacturer and purchaser.

8.1.4 Acceptance or rejection based upon grain size shall depend only on the average grain size of a test specimen as prescribed in **Section 11**. Each specimen shall be within the limits prescribed in **Table 2** when determined in accordance with Test Methods **E112**.

9. Dimensions, Mass, and Permissible Variation

9.1 All dimensions and tolerances of cups shall be as indicated on the drawings furnished with the purchase order or contract.

TABLE 2 Grain Size Requirements on Sidewall^A for Annealed (OS) Product

Type	Caliber	Temper Codes (B601)	Diameter of Average Grain Size, mm	
			min	max
			I	0.30 and 0.45 0.50
II	Grain size subject to agreement between the manufacturer and purchaser			

^A Approximately midway of the length of the sidewall.

10. Workmanship, Finish, and Appearance

10.1 The cups shall be uniform in quality and shall be free of oil, grease, oxidation, stains, scale, chips, acid, dirt or grit, dented or bent edges, laminations, slivers, laps, cracks, deep scratches, wrinkles, or other injurious defects which would interfere with the purpose for which the cups are intended. The cups, subsequent to annealing, shall be finish, plain pickled, and dried.

11. Sampling

11.1 The lot size, portion size, and selection of pieces shall be as follows:

11.1.1 *Lot Size*—40 000 lb (18 144 kg) or fraction thereof.

11.1.2 *Portion Size*:

11.1.2.1 For grain size—15 cups for Type I, or 2 cups for Type II.

11.1.2.2 For determination of dimensions—200 cups.

11.1.2.3 For the visual inspection—2000 cups.

11.1.3 Samples for chemical analysis are to be taken in accordance with Practice **E255**.

12. Number of Tests and Retests

12.1 *Test*:

12.1.1 *Chemical Analysis*—Chemical composition shall be determined in accordance with the element mean of the results from at least two replicate analyses of the sample(s).

12.2 *Other Tests*:

12.2.1 *Visual Inspection*—Each cup in the sample shall be visually inspected.

12.2.1.1 *Major Defects*—Not more than 0.25 % of the cups in the sample shall contain the following major defects – scaly metal, deep scratches, laminations, slivers, laps, cracks, and wrinkles.

12.2.1.2 *Minor Defects*—Not more than 2 % of the cups in the sample shall contain the following minor defects – oily cup, greasy cup, dirty or gritty cup, oxidized cup, stained cup, dented or bent edges, and scratches.

12.2.2 *Grain Size*—Specimens taken from each sample piece selected in accordance with **11.1.2.1** shall be tested for conformance to the grain size requirement.

NOTE 1—A deep scratch is one 0.005 in. (0.13 mm) or greater in depth.

12.3 *Retests*:

12.3.1 If the chemical analysis fails to conform to the specified limits, analysis shall be made on a composite sample, prepared from the pieces selected from each portion involved, consisting of either 15 cups from Type I or two cups from Type II. The results of this retest shall comply with the specified requirements.

12.3.2 Failure of more than two samples of Type I cups to comply to the grain size requirements shall be cause for rejection of the lot. If two samples fail to comply a retest shall be permitted on a sample double that of the original sample. Each of the specimens so retested shall meet the specified requirements.

12.3.2.1 Failure of the two samples of Type II cups to comply to the grain size requirements shall be cause for rejection of the lot. If one sample fails, a retest shall be permitted on a sample double that of the original sample. Each of the specimens so retested shall meet the specified requirements.

13. Specimen Preparation

13.1 For grain size measurements, either tangential grinding and polishing, or cutting, mounting, and polishing methods may be used to reach the zone (Fig. 1).

13.1.1 The test specimen shall be prepared in accordance with Guide E3.

13.2 Specimens for chemical analysis shall be prepared in accordance with Practice E255.

14. Test Methods

14.1 *Chemical Analyses:*

14.1.1 In cases of disagreement, test methods for chemical analysis shall be subject to agreement between the manufacturer or supplier and the purchaser.

NOTE 2—The following table includes published test methods, which may no longer be viable, for reference.

Test	Method
Copper	E478
Lead	E478 (AA)
Iron	E478
Zinc	E478 (Titrimetric)

14.1.2 Test method(s) to be followed for the determination of element(s) resulting from contractual or purchase order agreement shall be as agreed upon between the manufacturer or supplier and purchaser.

14.1.2.1 Since no recognized test method is known to be published, the determination of bismuth shall be subject to agreement between the manufacturer and the purchaser.

14.2 *Other Tests:*

14.2.1 The product furnished shall conform to specified requirements when subjected to test in accordance with the following table:

Test	Method
Grain Size	E3, E112

14.2.2 Grain size measurements shall be made in a zone which is the approximate midpoint of the side wall length and thickness of the cups, as shown in Fig. 1. At least three measurements shall be made, averaged, and recorded for each grain size determination. In case of dispute, the intercept method of Test Methods E112 shall be followed.

14.2.3 When specified on the purchase order or contract, grain size measurements shall also be made on the base of the same cups as 14.2.2. These measurements shall be made in a zone approximately bounding the midpoint of the base, and approximately the midpoint of the thickness as shown in Fig. 1. At least three measurements shall be made, averaged, and recorded for each grain size determination. In case of dispute, the intercept method of Test Methods E112 shall be followed.

15. Significance of Numerical Limits

15.1 For the purpose of determining compliance with the specified limits for requirements of the properties listed in the following table, an observed value or a calculated value shall be rounded as indicated in accordance with the rounding method of Practice E29.

Property	Rounded Unit for Observed or Calculated Value
Chemical Composition	Nearest unit in the last right-hand significant digit used in expressing the limiting value
Grain size:	
Under 0.060 mm	Nearest multiple of 0.005 mm
0.060 mm and over	Nearest 0.01 mm

16. Inspection

16.1 The manufacturer, or supplier, shall inspect and make tests necessary to verify the furnished product conforms to specification requirements.

16.2 *Measurement of Dimensions*—Each sample cup shall be gaged for compliance with all the dimensions shown on the applicable drawing. In addition, each cup in the sample shall be measured for side wall thickness at two or more opposite points on the same periphery. The variation in wall thickness of any cup so measured shall be within the limits as shown on the drawing.

NOTE 3—For the purpose of determining conformance with the dimensional requirements prescribed in this specification, any measured value outside the specified limiting values for any dimension may be cause for rejection.

16.3 Source inspection of the product by the purchaser may be agreed upon between the manufacturer, or supplier, and the purchaser as part of the purchase order. In such case, the nature of the facilities needed to satisfy the inspector, representing the purchaser, that the product is being furnished in accordance with the specification, shall be included in the agreement. All testing and inspection shall be conducted so as not to interfere unnecessarily with the operation of the works.

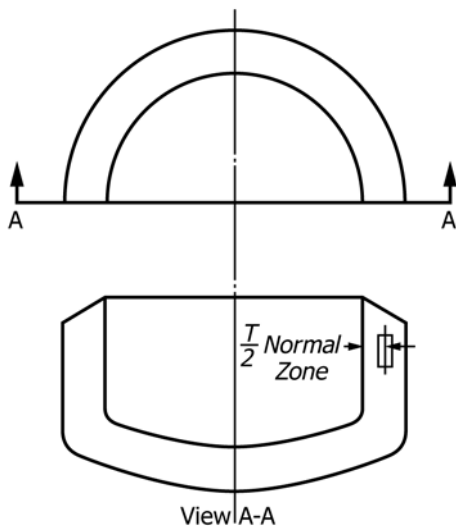


FIG. 1 Location of Areas to be Examined for Grain Size in Cartridge Case Cups