Designation: B121/B121M – 01 (Reapproved 2006)

Standard Specification for Leaded Brass Plate, Sheet, Strip, and Rolled Bar[1]

This standard is issued under the fixed designation B121/B121M; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification establishes the requirements for copper-zinc-lead alloys (leaded brass) plate, sheet, strip, and rolled bar. The following alloys are covered:

Copper Alloy UNS No.[2]	Previously Used Designation	Nominal Composition, %			
		Copper	Zinc	Lead	Iron
C33500	2	65.0	34.5	0.5	...
C34000	3	65.0	34.0	1.0	...
C34200	5	65.0	33.0	2.0	...
C35000	...	61.5	37.4	1.1	...
C35300	4	61.2	37.0	1.8	...
C35600	6	61.2	36.3	2.5	...

1.2 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

2. Referenced Documents

2.1 The following documents in the current issue of Book of Standards form a part of this specification to the extent referenced herein:

2.2 *ASTM Standards:*[3]

B248 Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar

B248M Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar (Metric)

B601 Classification for Temper Designations for Copper and Copper Alloys—Wrought and Cast

B846 Terminology for Copper and Copper Alloys

E8 Test Methods for Tension Testing of Metallic Materials

E8M Test Methods for Tension Testing of Metallic Materials [Metric][4]

E76 Test Methods for Chemical Analysis of Nickel-Copper Alloys[4]

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 part of this specification:

3.1.1 Terminology—Definitions,
3.1.2 Materials and Manufacturing,
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),
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 4.1 appears in this specification, it contains additional requirements, which supplement those appearing in Specification B248.

[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] 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 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] Withdrawn. 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. Terminology

4.1 *Definitions*—For standard terms related to copper and copper alloys, refer to Terminology B846.

5. Ordering Information

5.1 Orders for product should include the following information, as applicable:

5.1.1 ASTM designation and year of issue (B121/B121M – XX).

5.1.2 Copper (alloy) UNS No. designation,

5.1.3 Temper (Section 8),

5.1.4 Dimensions: thickness and width (see 12.1.1 and 12.1.2),

5.1.5 Type of edge, if required: slit, sheared, sawed, square corners, rounded corners, rounded edges, or full-rounded edges (see 12.1.5),

5.1.6 How furnished (straight lengths or coils),

5.1.7 Lengths (see 12.1.3),

5.1.8 Weight: total for each size, and

5.2 In addition, when product is purchased for agencies of the U. S. government, it shall conform to the Supplementary Requirements as defined in Specification B248 or B248M when specified in the contract or purchase order.

6. Materials and Manufacture

6.1 *Material*:

6.1.1 The material of manufacture shall be a cast bar, cake, slab, and so forth. of copper alloy UNS No. C35500, C34000, C34200, C35000, C35300, or C35600 as specified in the ordering information.

6.1.2 In the event that heat identification or traceability is required, the purchaser shall specify the details desired.

NOTE 1—Because of 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 in the ordering information.

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

7. Chemical Composition

7.1 The materials shall conform to the compositions prescribed in Table 1.

TABLE 1 Chemical Requirements

Copper Alloy UNS No.	Composition			
	Copper	Lead	Iron	Zinc
C33500	62.0–65.0	0.25–0.7	0.10 max	remainder
C34000	62.0–65.0	0.8–1.5	0.10 max	remainder
C34200	62.0–65.0	1.5–2.5	0.10 max	remainder
C35000	60.0–63.0	0.8–2.0	0.10 max	remainder
C35300	60.0–63.0	1.5–2.5	0.10 max	remainder
C35600	60.0–63.0	2.0–3.0	0.10 max	remainder

7.2 These specification limits do not preclude the presence of other elements. Limits for unnamed elements may be established by agreement between manufacturer or supplier and purchaser.

7.3 Either copper or zinc may be taken as the difference between the sum of all elements analyzed and 100 %. When all elements in Table 1 are analyzed, their sum shall be as shown in the table below.

Copper Alloy UNS No.	Copper Plus Named Elements, % min.
C33500	99.6
C34000	99.6
C34200	99.6
C35000	99.6
C35300	99.5
C35600	99.5

8. Temper

8.1 *Rolled Material*—The standard tempers of rolled product are as designated in Table 2 in the column entitled "Temper Standard." Special or nonstandard tempers are subject to negotiation between manufacturer or supplier and purchaser.

8.2 *Annealed Material*—The standard tempers of annealed product are as designated in Table 3 in the column entitled "Standard Temper Designation." Special or nonstandard tempers are subject to negotiation between manufacturer or supplier and purchaser.

9. Mechanical Property Requirements

9.1 *Tensile Strength*:

9.1.1 Products ordered to this specification in inch-pound units shall be tested in accordance with Test Methods E8, and shall conform to tensile strength requirements prescribed in ksi units in Table 2.

9.1.2 Products ordered to this specification in SI units shall be tested in accordance with Test Methods E8M, and shall conform to tensile strength requirements prescribed in MPa units in Table 2.

9.1.3 Acceptance or rejection of roll temper product based on mechanical properties shall depend only on the tensile strength.

9.2 *Rockwell Hardness*:

9.2.1 Rockwell hardness tests offer a quick and convenient method of checking leaded brass of any temper for general conformity to the requirements for tensile strength or grain size. The approximate Rockwell hardness values for the rolled tempers are given in Table 2, and those for the annealed tempers of material 0.015 in. [0.381 mm] and over in thickness are given in Table 4 for general information and assistance in testing.

9.2.2 Rockwell hardness test results shall not be used as a basis for product rejection.

10. Grain Size for Annealed Tempers

10.1 Grain size shall be the standard requirement for all products in the annealed tempers.

10.2 Acceptance or rejection based upon grain size shall depend only on the average grain size of test specimens taken from each of two sampling portions and each specimen shall be