



AEROSPACE MATERIAL SPECIFICATION	AMS4505™	REV. M
	Issued 1940-01 Reaffirmed 2014-10 Revised 2024-09 Superseding AMS4505L	
Copper Alloy (Brass), Sheet, Strip, and Plate, 70Cu - 30Zn, Annealed (OS035) (Composition similar to UNS C26000)		

RATIONALE

AMS4505M results from a Five-Year Review and update of this specification with changes to update general agreement language to prohibit unauthorized exceptions (see 8.5), relocate Definitions (see 2.3), add standard note related to units used in AMS material specifications (see 8.2), and update Applicable Documents (see Section 2), Composition (see 3.1), and Ordering Information (see 8.6).

1. SCOPE

1.1 Form

This specification covers a copper-zinc alloy (brass) in the form of sheet, strip, and plate (see 8.6).

1.2 Application

These products have been used typically for formed and drawn parts, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2222 Tolerances, Copper and Copper Alloy Sheet, Strip, and Plate

AS7766 Terms Used in Aerospace Metals Specifications

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<https://www.sae.org/standards/content/AMS4505M/>

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

- ASTM B248 General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar
- ASTM B248M General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar (Metric)
- ASTM B601 Temper Designations for Copper and Copper Alloys-Wrought and Cast
- ASTM E18 Rockwell Hardness of Metallic Materials
- ASTM E112 Determining Average Grain Size
- ASTM E140 Standard Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness
- ASTM E478 Chemical Analysis of Copper Alloys

2.3 Definitions

Terms used in AMS are defined in AS7766.

2.3.1 Copper temper designations are defined in ASTM B601.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM E478 or by other analytical methods acceptable to the purchaser (see 8.6).

Table 1 - Composition

Element (see 3.1.1)	Min	Max
Copper	68.5	71.5
Lead	--	0.07
Iron	--	0.05
Zinc (see 3.1.2)	remainder	--
Sum of Named Elements (see 3.1.1)	99.7	--

3.1.1 These composition limits do not preclude the presence of other elements. Limits may be established and analysis required for unnamed elements by agreement between the manufacturer or the supplier and purchaser (see 8.6).

3.1.2 Zinc may be reported as "remainder," as the difference between the sum of results for all elements and 100%, or as the result of direct analysis.

3.1.3 When all the elements in the table are analyzed, the sum shall be 99.7% minimum, but such determination is not required for routine acceptance of each lot.

3.2 Condition

Cold rolled and fully recrystallized, annealed (OS035) temper (see 2.3.1).

3.3 Properties

The product shall conform to the following requirements:

3.3.1 Average Grain Size

Shall be 0.025 to 0.050 mm, determined in accordance with ASTM E112.

3.3.2 Hardness

Shall be 25 to 38 HR30T, or equivalent, determined in accordance with ASTM E18 (see 8.3).

3.4 Quality

The product, as received by the purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances

Shall conform to AMS2222 as applicable to nonrefractory alloys.

3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests

All technical requirements are acceptance tests and shall be performed on each lot.

4.3 Sampling and Testing

Shall be in accordance with ASTM B248 or ASTM B248M.

4.4 Reports

The producer of the product shall furnish with each shipment a report showing the results of tests on each lot to determine conformance to all technical requirements. This report shall include the purchase order number, lot number, AMS4505M, size, and quantity.

4.4.1 When material produced to this specification has exceptions authorized by the purchaser taken to the technical requirements listed in Section 3, the report shall contain a statement "This material is certified as AMS4505M(EXC) because of the following exceptions:" and the specific exceptions shall be listed.

4.5 Resampling and Retesting

If any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing two additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY

5.1 Identification

The product shall be identified as in 5.1.1 unless line marking as in 5.1.2 is specified by the purchaser.

5.1.1 Each sheet, strip, and plate shall be legibly marked near one end, coils being marked near the outside end, with AMS4505M, lot number, manufacturer's identification, and nominal thickness, using any suitable marking fluid. As an alternative method, individual pieces or bundles shall have attached a durable tag marked with the above information or shall be boxed and the box marked with the same information.

5.1.2 When specified by the purchaser, each sheet, strip, and plate shall be legibly marked on one face, in the respective location indicated below, with AMS4505M, lot number, manufacturer's identification, and nominal thickness. The characters shall be applied using a suitable marking fluid removable in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the product or its performance and shall be sufficiently stable to withstand normal handling. The specification number, manufacturer's identification, and nominal thickness shall be continuously line marked; the lot number may be included in the line marking or may be marked at one location on each piece.

5.1.2.1 Flat Strip 6 Inches (152 mm) and Under in Width

Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 feet (914 mm).

5.1.2.2 Flat Sheet, Flat Strip Over 6 Inches (152 mm) in Width, and Plate

Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 feet (914 mm), with the rows being spaced not more than 6 inches (152 mm) apart and alternately staggered.

5.1.2.3 Coiled Sheet and Strip

Shall be legibly marked near both the outside and inside ends of the coil; the markings shall be applied as in 5.1.2 or shall appear on a durable tag or label attached to the coil and marked with the information of 5.1.2. When the product is wound on cores, the tag or label may be attached to the core.

5.1.3 When technical exceptions are taken (see 4.4.1), the material shall be marked with AMS4505M(EXC).

5.2 Packaging

The product shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A producer shall include this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Product not conforming to this specification, or to modifications authorized by the purchaser, will be subject to rejection.