AEROSPACE MATERIAL SPECIFICATION

AMS4558™	REV. J

Issued 1948-05
Reaffirmed 2012-02
Revised 2022-09

Superseding AMS4558H

Brass, Seamless Tubing
66.5Cu - 31.5Zn - 1.6Pb
Drawn Temper (H58)
(Composition similar to UNS C33200)

RATIONALE

AMS4558J results from a Five-Year Review and update of this specification with changes to update general agreement language related to prohibition of unauthorized exceptions (3.7, 4.4.1, 8.5); update applicable documents (Section 2, 4.3), composition (3.1), residual stress terminology (previously embrittlement) (3.4.2, 4.2.2), and ordering information (8.6); and allow the use of the immediate prior specification revision (8.4).

1. SCOPE

1.1 Form

This specification covers a copper alloy (brass) in the form of seamless tubing.

1.2 Application

This tubing has been used typically for screw machine 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.

AMS2223	Tolerances, Copper and Copper Alloy Seamless Tubing
AS7766	Terms Used in Aerospace Metals Specifications

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS4558J/

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 B154 Mercurous Nitrate Test for Copper Alloys

ASTM B251/B251M General Requirements for Wrought Seamless Copper and Copper-Alloy Tube

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

ASTM B858 Ammonia Vapor Test for Determining Susceptibility to Stress Corrosion Cracking in Copper Alloys

ASTM E8/E8M Tension Testing of Metallic Materials

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 purchaser.

Table 1 - Composition

Element (3.1.1)	Min	Max
Copper	65.0	68.0
Lead	1.5	2.5
Iron	--	0.07
Zinc (3.1.2)	remainder	
Sum of Named Elements (3.1.3)	99.6	

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 supplier and purchaser.

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 named elements in Table 1 are analyzed, the sum shall be 99.6% minimum, but such determination is not required for routine acceptance of each lot.

3.2 Condition

Drawn temper, general purpose (H58) (see 2.3.1).

3.3 Fabrication

Tubing shall be produced by a seamless process. The external and internal surface finishes shall be produced by any method which will result in surfaces free from laps, folds, tears, and extraneous materials and which show no oxide discoloration. Processing shall not affect limits of wall thickness or corrosion resistance.

3.4 Properties

Tubing shall conform to the following requirements:

3.4.1 Tensile Strength

Shall be not lower than 54.0 ksi (372 MPa), determined in accordance with ASTM E/E8M.

3.4.2 Residual Stress Testing

Specimens of tubing, nominally 6 inches (152 mm) in length or twice the diameter, whichever is greater, shall withstand, without cracking, the mercurous nitrate test performed in accordance with ASTM B154, Procedure A, or the ammonia vapor test in accordance with ASTM B858.

3.5 Quality

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

3.6 Tolerances

Shall conform to AMS2223 as applicable to nonrefractory alloys.

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

4.2 Classification of Tests

4.2.1 Acceptance Tests

Composition (3.1), tensile strength (3.4.1), and tolerances (3.6) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests

Residual stress testing (3.4.2) is a periodic test and shall be performed at a frequency selected by the producer unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing

Shall be in accordance with ASTM B251/B251M.

4.4 Reports

The producer of tubing shall furnish with each shipment a report showing the results of tests for chemical composition and tensile properties, and stating that the tubing conforms to the other technical requirements. This report shall include the purchase order number, lot number, AMS4558J, nominal size, and quantity.

4.4.1 When material produced to this specification has exceptions taken to the technical requirements listed in Section 3 (see 5.1.1), the report shall contain a statement "This material is certified as AMS4558J(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 specified requirements, disposition of the tubing may be based on the results of testing two additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet specified requirements shall be cause for rejection of the tubing represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY

5.1 Identification

Individual tubes or bundles shall have attached a durable tag marked with not less than the purchase order number, lot number, AMS4558J, and nominal size, or shall be boxed and the box marked with the same information.

5.1.1 When technical exceptions are taken (see 4.4.1), the material shall be marked with AMS4558J(EXC).

5.2 Packaging

Tubing 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 mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

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

8. NOTES

8.1 Revision Indicator

A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 Hardness should be not lower than as shown in Table 2, determined in accordance with ASTM E18. Hardness has been used to verify that product is properly processed, but an “out-of-range hardness number” is not always indicative of product with “out-of-specification tensile strength.” Further analysis including material composition verification, heat treat process parameter review, and/or tensile property measurement on product with out-of-range hardness may be necessary.

8.3 Dimensions and properties in inch/pound units and the Fahrenheit temperatures are primary; dimensions and properties in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.4 Unless otherwise specified, the material producer shall work to the revision of this specification (AMS4558) in effect on the date of order placement. Unless otherwise specified, material manufactured and certified to the immediately previous revision of this specification (AMS4558) may be procured and used until inventory is depleted.

8.5 It is the purchaser’s obligation to ensure that product they procure or resell as AMS4558 has any exceptions approved by their subsequent purchaser.