



AEROSPACE MATERIAL SPECIFICATION	AMS4720™	REV. J
	Issued	1940-03
	Revised	2022-06
Superseding AMS4720H		
Wire, Phosphor Bronze 94Cu - 5.0Sn - 0.19P Cold Drawn, Spring Temper (H08) (Composition similar to UNS C51000)		

RATIONALE

AMS4720J results from a Five-Year Review and update of this specification, with changes to prohibit unauthorized exceptions (3.3.1.1, 3.6, 4.4.1, 5.2.1, 8.5); update applicable documents (Section 2), and composition (3.1); relocate definitions from Section 8 to Section 2; and allow the use of the immediate prior specification revision (8.4).

1. SCOPE

1.1 Form

This specification covers one type of bronze in the form of round wire 0.500 inch (12.70 mm) and under in nominal diameter (see 8.5).

1.2 Application

This wire has been used typically for springs, 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.

AMS2224 Tolerances, Copper and Copper Alloy Wire

AS7766 Terms Used in Aerospace Metals Specifications

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For more information on this standard, visit
<https://www.sae.org/standards/content/AMS4720J/>

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 B250/B250M General Requirements for Wrought Copper-Alloy Wire

ASTM B601 Temper Designations for Copper and Copper Alloys - Wrought and Cast

ASTM E8/E8M Tension Testing of Metallic Materials

ASTM E290 Bend Testing of Material for Ductility

ASTM E478 Chemical Analysis of Copper Alloys

2.3 Definitions

Terms used in AMS are clarified 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
Tin	4.2	5.8
Phosphorus	0.03	0.35
Zinc	--	0.30
Iron	--	0.10
Lead	--	0.05
Copper (3.1.2) + Sum of Named Elements (3.1.3)	99.5	--

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 Copper may be reported as "remainder," or 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 99.5% minimum, but such determination is not required for routine acceptance of each lot.

3.2 Condition

Cold-drawn, spring (H08) temper (see 2.3.1).

3.3 Properties

Wire shall conform to the following requirements:

3.3.1 Tensile Properties

Shall be as specified in Table 2, determined in accordance with ASTM E8/E8M.

- 3.3.1.1 Mechanical property requirements for product outside of the range covered by Table 2 shall be agreed upon between purchaser and producer and reported per 4.4.1 (see 8.5).

Table 2A - Minimum tensile properties, inch/pound units

Nominal Diameter Inches	Tensile Strength ksi	Elongation in 2 Inches %
Up to 0.025, incl	145.0	--
Over 0.025 to 0.063, incl	135.0	--
Over 0.063 to 0.125, incl	130.0	--
Over 0.125 to 0.250, incl	125.0	--
Over 0.250 to 0.375, incl	120.0	5
Over 0.375 to 0.500, incl	105.0	9

Table 2B - Minimum tensile properties, SI units

Nominal Diameter Millimeters	Tensile Strength MPa	Elongation in 50.8 mm %
Up to 0.64, incl	1000	--
Over 0.64 to 1.60, incl	931	--
Over 1.60 to 3.18, incl	896	--
Over 3.18 to 6.35, incl	862	--
Over 6.35 to 9.52, incl	827	5
Over 9.52 to 12.70, incl	724	9

3.3.2 Bending

Wire 0.250 inch (6.35 mm) and under in nominal diameter shall withstand, without cracking, bending in accordance with ASTM E290 through an angle of 120 degrees around a diameter equal to twice the nominal diameter of the wire.

3.4 Quality

Wire, 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 wire.

3.5 Tolerances

Shall conform to AMS2224 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 wire 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 wire conforms to the 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 B250/B250M.

4.4 Reports

The producer of wire shall furnish with each shipment a report showing the results of tests on each lot to determine conformance to the technical requirements. This report shall include the purchase order number, lot number, AMS4720J, nominal size, and quantity.

4.4.1 When material produced to this specification is beyond the sizes allowed in the scope or tables, or other exceptions are taken to the technical requirements listed in Section 3, the report shall contain a statement "This material is certified as AMS4720J(EXC) because of the following exceptions:" and the specific exceptions shall be listed (also see 5.2.1).

4.5 Resampling and Retesting

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

5. PREPARATION FOR DELIVERY

5.1 Wire shall be supplied on spools or in coils except when straight lengths are ordered.

5.2 Identification

5.2.1 Spools and Coils

Shall be marked with a durable tag or label showing not less than the manufacturer's identification, purchase order number, lot number, AMS4720J, nominal size, and quantity; boxes or drums shall be marked with the same information. When technical exceptions are taken (see 4.4.1), the material shall be identified with AMS4720J(EXC).

5.2.2 Straight Lengths

Shall have attached to each bundle or enclosed in each box a durable tag or label marked with the information of 5.2.1; when boxed, the box shall be marked with the same information.

5.3 Packaging

5.3.1 Spools and Coils

Coils shall be individually wrapped with waterproof paper or packed in waterproof drums. Spools, when ordered, shall be boxed.

5.3.2 Straight Lengths

Shall be bundled or boxed.

5.3.3 Packages of wire 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 wire to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

6. ACKNOWLEDGMENT

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