

AEROSPACE MATERIAL SPECIFICATION

SAE AMS4701G

Issued 1947-07
Reaffirmed 2007-04
Revised 2009-10

Superseding AMS4701F

Copper Wire, Oxygen-Free
99.95(Cu+Ag)
Annealed

(Composition similar to UNS C10200)

RATIONALE

AMS4701G results from a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers one type of copper in the form of wire.

1.2 Application

This wire has been used typically for copper brazing, high-conductivity bonding, and emergency lockwiring, 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 724-776-4970 (outside USA), www.sae.org

AMS2224 Tolerances, Copper and Copper Alloy Wire

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2.2 ASTM Specifications

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 B 250/B 250M	General Requirements for Wrought Copper-Alloy Wire
ASTM B 577	Detection of Cuprous Oxide (Hydrogen Embrittlement Susceptibility) in Copper
ASTM E 8/E 8M	Tension Testing of Metallic Materials
ASTM E 53	Determination of Copper in Unalloyed Copper by Gravimetry

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall be oxygen-free copper containing not less than 99.95% by weight copper, including silver, and not more than 0.0010% oxygen, determined by wet chemical methods in accordance with ASTM E 53, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

3.2 Condition

Cold drawn or cold rolled, and annealed (061) (see 8.2).

3.3 Properties

Wire shall conform to the following requirements:

3.3.1 Tensile Elongation

Shall be as shown in Table 1 or Table 2, as applicable, determined in accordance with ASTM E 8/E 8M.

3.3.1.1 Rounds, Hexagons, Octagons

Shall be shown in Table 1.

TABLE 1 - MINIMUM ELONGATION

Nominal Diameter or Least Distance Between Parallel Sides Inch	Nominal Diameter or Least Distance Between Parallel Sides Millimeters	Elongation in 10 Inches (254 mm) %
Up to 0.0113, excl	Up to 0.287, excl	15
0.0113 to 0.0226, excl	0.287 to 0.574, excl	20
0.0226 to 0.1144, excl	0.574 to 2.906, excl	25
0.1144 to 0.2893, incl	2.906 to 7.348, incl	30
Over 0.2893	Over 7.348	35

3.3.1.2 Squares, Rectangles

Shall be shown in Table 2.

TABLE 2 - MINIMUM ELONGATION

Thickness or Nominal Distance Between Parallel Sides Inch	Thickness or Nominal Distance Between Parallel Sides Millimeters	Elongation in 10 Inches (254 mm) %
Up to 0.011, excl	Up to 0.28, excl	20
0.011 to 0.021, excl	0.28 to 0.53, excl	25
0.021 to 0.051, excl	0.53 to 1.30, excl	30
0.051 to 0.290, excl	1.30 to 7.37, excl	32
0.290 and over	7.37 and over	35

3.3.2 Hydrogen Embrittlement

Wire, after exposure to hydrogen, shall withstand, without cracking, 8 bends determined in accordance with ASTM B 577, Method D.

3.4 Quality

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

3.5 Tolerances

Shall conform to AMS2224 as applicable to copper and nonrefractory alloys.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of wire shall supply all samples for vendor'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 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 B 250/B 250M.

4.4 Reports

The vendor 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, AMS4701G, nominal size, and quantity.

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 legibly marked, by a durable tag or label, with not less than the manufacturer's identification, purchase order number, AMS4701G, nominal size, and quantity; boxes or drums shall be marked with the same information.

5.2.2 Straight Lengths

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

6. ACKNOWLEDGMENT

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

7. REJECTIONS

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

8. NOTES

8.1 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 Copper temper designations are defined in ASTM B 601.

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.