



# AEROSPACE MATERIAL SPECIFICATION

**AMS4701****REV. H**

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|------------|---------|
| Issued     | 1947-07 |
| Reaffirmed | 2007-04 |
| Revised    | 2009-10 |
| Stabilized | 2015-08 |

Superseding AMS4701G

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

(Composition similar to UNS C10200)

## RATIONALE

AMS4701H stabilizes this document because it represents mature technology which is not expected to change and thus no further revisions are anticipated.

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## 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](http://www.sae.org)

AMS2224      Tolerances, Copper and Copper Alloy Wire

SAENORM.COM : Click to view the full PDF of ams4701H

## 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](http://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<br>or Least Distance<br>Between Parallel Sides<br>Inch | Nominal Diameter<br>or Least Distance<br>Between Parallel Sides<br>Millimeters | Elongation<br>in 10 Inches<br>(254 mm)<br>% |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------|
| 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<br>Nominal Distance<br>Between Parallel Sides<br>Inch | Thickness or<br>Nominal Distance<br>Between Parallel Sides<br>Millimeters | Elongation<br>in 10 Inches<br>(254 mm)<br>% |
|--------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------|
| 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, AMS4701H, 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.