

SAE-AMS4500

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400 Commonwealth Drive, Warrendale, PA 15096-0001

# AEROSPACE MATERIAL SPECIFICATION

**SAE**

**AMS 4500G**

Issued JAN 1940  
Revised APR 1994  
Superseding AMS 4500F

Submitted for recognition as an American National Standard

## COPPER, SHEET, STRIP, AND PLATE Soft Annealed

UNS C11000

### 1. SCOPE:

#### 1.1 Form:

This specification covers unalloyed copper in the form of sheet, strip, and plate.

#### 1.2 Application:

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

### 2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

#### 2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

- AMS 2222 Tolerances, Copper and Copper Alloy Sheet, Strip, and Plate
- MAM 2222 Tolerances, Metric, Copper and Copper Alloy Sheet, Strip, and Plate

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**2.2 ASTM Publications:**

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 193	Resistivity of Electrical Conductor Materials
ASTM B 248	General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar
ASTM B 248M	General Requirements for Wrought Copper and Copper-Alloy Plate Sheet, Strip, and Rolled Bar (Metric)
ASTM E 18	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 53	Chemical Analysis of Copper
ASTM E 290	Semi-Guided Bend Test for Ductility of Metallic Materials

**2.3 U.S. Government Publications:**

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-C-3993 Copper and Copper-Base Alloy Mill Products, Packaging of

**3. TECHNICAL REQUIREMENTS:****3.1 Material:**

Shall be electrolytic tough pitch or oxygen-free copper containing not less than 99.90% by weight copper (including silver), 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:****(R)**

Cold rolled and fully recrystallized, in soft (060), bright-annealed temper (see 8.2).

**3.3 Properties:**

The product shall conform to the following requirements:

- 3.3.1 Bending:** The product shall withstand, without cracking, bending in accordance with ASTM E 290 at room temperature flat on itself with axis of bend parallel to the direction of rolling.
- 3.3.2 Hardness:** Shall be not higher than shown in Table 1, determined in accordance with ASTM E 18.

TABLE 1 - Maximum Hardness

Nominal Thickness Inch	Nominal Thickness mm	Hardness
0.015 to 0.030, excl 0.030 and over	0.38 to 0.76, excl 0.76 and over	68 HR15T 65 HRF

3.3.3 Electrical Resistivity: Shall be not greater than 0.15328  $\Omega \cdot g/m^2$  at 20 °C  $\pm$  2 (68 °F  $\pm$  4), determined in accordance with ASTM B 193.

3.4 Quality:

The product, 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 product.

3.5 Tolerances:

Shall conform to AMS 2222 or MAM 2222 as applicable to non-refractory alloys.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

(R)

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

Tests for 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 248 or ASTM B 248M.

4.4 Reports:

(R)

The vendor of the product shall furnish with each shipment a report stating that the product conforms to the chemical composition and showing the results of tests to determine conformance to the other technical requirements. This report shall include the purchase order number, lot number, AMS 4500G, size, and quantity.

4.5 Resampling and Retesting:

(R)

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 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 product represented. Results of all tests shall be reported.