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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4725D

Issued DEC 1947
Revised JAN 1983
Reaffirmed OCT 2000

Superseding AMS 4725C

Copper-Beryllium Alloy Wire
98Cu - 1.9Be
Solution Heat Treated

UNS C17200

1. SCOPE:

1.1 Form:

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

1.2 Application:

Primarily for parts requiring high strength with good electrical conductivity or lack of magnetic susceptibility.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications:

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

2.1.1 Aerospace Material Specifications:

AMS 2224 Tolerances, Copper and Copper Alloy Wire
AMS 2350 Standards and Test Methods

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.2 ASTM Publications:

Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103.

ASTM B250 General Requirements for Wrought Copper-Alloy Wire
ASTM E8 Tension Testing of Metallic Materials
ASTM E106 Chemical Analysis of Copper-Beryllium Alloys

2.3 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 Metals; Test Methods

2.3.2 Military Specifications:

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

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E106, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

	min		max
Beryllium	1.80	-	2.00
Additive Elements			
Nickel + Cobalt	0.20		- -
Nickel + Cobalt + Iron	- -		0.6
Aluminum	- -		0.20
Silicon	- -		0.20
Other Elements, each	- -		0.10
Other Elements, total	- -		0.50
Copper	remainder		

3.2 Condition:

Cold drawn or rolled and solution treated, in a condition suitable for precipitation heat treatment.

3.3 Properties:

Wire shall conform to the following requirements:

3.3.1 Tensile Properties as Solution Heat Treated: Shall be as follows, determined in accordance with ASTM E8:

Tensile Strength	58,000 - 78,000 psi (400 - 540 MPa)
Elongation in 2 in. (50 mm), min	35%

3.3.2 Microstructure: Shall reveal a minimum of beta phase constituent. Any beta phase present shall be fine and well dispersed and shall not be in the form of stringers. Wire may be precipitation heat treated as in 3.3.4 before examination.

3.3.3 Bend Test: Wire shall withstand, without cracking, wrapping at room temperature five full, closely-spaced turns around a diameter equal to the nominal diameter or thickness of the wire.

3.3.4 Tensile Properties After Precipitation Heat Treatment: Wire shall have the following properties after being precipitation heat treated by heating to 600° - 625°F (315° - 330°C), holding at heat for 3 hr ± 0.25, and cooling in air:

Tensile Strength	165,000 - 190,000 psi (1140 - 1310 MPa)
Elongation in 2 in. (50 mm), min	3.0%

3.4 Quality:

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

3.5 Tolerances:

Unless otherwise specified, tolerances shall conform to AMS 2224 as applicable to refractory 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 performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the wire conforms to the requirements of this specification.

4.2 Classification of Tests:

Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling:

Shall be in accordance with AMS B250.

4.4 Reports:

4.4.1 The vendor of wire shall furnish with each shipment three copies of a report showing the results of tests for chemical composition of each lot and the results of tests on each lot to determine conformance to the other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 4725D, size, and quantity from each lot.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, AMS 4725D, contractor or other direct supplier of wire, part number, and quantity. When wire for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of wire to determine conformance to the requirements of this specification and shall include in the report either a statement that the wire conforms or copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting:

If any specimen used in the above tests fails to meet the specified requirements, disposition of the ire 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 and no additional testing shall be permitted. Results of all tests shall be reported.