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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4632D

Issued	NOV 1946
Revised	JUL 1978
Noncurrent	JAN 1983
Reaf. Noncur.	NOV 1999

Superseding AMS 4632C

Submitted for recognition as an American National Standard

Aluminum Bronze Bars and Rods
90Cu - 8.5Al
Hard

NONCURRENT NOTICE

This specification has been declared “NONCURRENT” by the Aerospace Materials Division, SAE, as of January 1983. Copper Development Association has advised that Alloy No. 617 is no longer in production. It is recommended, therefore, that this specification not be specified for new designs.

“NONCURRENT” refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs. Each of these “NONCURRENT” specifications is available from SAE upon request.

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1. SCOPE:

1.1 Form:

This specification covers one type of aluminum bronze in the form of bars and rods.

1.2 Application:

Primarily for parts, such as bushings, requiring strength and corrosion resistance at moderate temperatures.

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 15096-0001.

2.1.1 Aerospace Material Specifications:

AMS 2221	Tolerances, Copper and Copper Alloy Rods and Bars
AMS 2350	Standards and Test Methods

2.2 ASTM Publications:

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

ASTM B154	Mercurous Nitrate Test for Copper and Copper Alloys
ASTM B249	General Requirements for Wrought Copper and Copper-Alloy Rod, Bar, and Shapes
ASTM E8	Tension Testing of Metallic Materials
ASTM E10	Brinell Hardness of Metallic Materials
ASTM E18	Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E478	Chemical Analysis of Copper-Base Alloys

2.3 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 E478, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

	min	max
Copper	87.0	--
Aluminum	7.0	10.0
Iron	--	1.5
Other Additions including Nickel, Tin, and Manganese	--	2.0
Total Named Elements	99.5	--

3.2 Condition:

Hot rolled or drawn, or extruded, cold finished if necessary, hard temper.

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as shown in Table 1, determined in accordance with ASTM E8.

TABLE 1

Nominal Diameter or Distance Between Parallel Sides Inches	Tensile Strength psi, min	Elongation in 4D %, min
Up to 0.5, incl	80,000	5
Over 0.5 to 1.0, incl	75,000	5
Over 1.0 to 2.0, incl	72,000	5

TABLE 1 (SI)

Nominal Diameter or Distance Between Parallel Sides Millimetres	Tensile Strength MPa, min	Elongation in 4D %, min
Up to 12.5, incl	552	5
Over 12.5 to 25, incl	517	5
Over 25 to 50, incl	496	5

3.3.1.1 Tensile property requirements for product over 2.00 in. (50 mm) in nominal diameter or distance between parallel sides shall be as agreed upon by purchaser and vendor.

3.3.2 Hardness: Should be as follows, or equivalent but the product shall not be rejected on the basis of hardness if the tensile property requirements are met:

3.3.2.1 Surface: Not lower than 165 HB/10/1000, determined in accordance with ASTM E10; on rounds, a flat as necessary for accuracy may be made.

3.3.2.2 Subsurface: Not lower than 91 HRB, determined in accordance with ASTM E18 at mid-radius of rounds or quarter-thickness of other shapes.

3.3.3 Embrittlement: Specimens as in 4.3.2 shall withstand, without cracking, immersion in mercurous nitrate solution in accordance with ASTM B154, Procedure A.

3.4 Quality:

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

3.5 Tolerances:

Unless otherwise specified, tolerances shall conform to AMS 2221 as applicable to refractory alloys.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples 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 perform such confirmatory testing as he deems necessary to ensure that the product conforms to the requirements of this specification.