INCH-POUND
AMS 4625F
10 APRIL 90

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Title of Document: AMS 4625F "Phosphor Bronze Bars, Rods, and Tubing"

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Releasing Industry Group: Society of Automotive Engineers, Inc.

NOTICE: When reaffirmation, amendment, revision or cancellation of this standard is initially proposed, the industry group responsible for this standard shall inform the military coordinating activity of the proposed change and request their participation.

Custodians:
Army - MR
Air Force - 11

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AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 4625F

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Superseding AMS 4625E

PHOSPHOR BRONZE BARS, RODS, AND TUBING
95Cu - 5Sn
Hard Temper

UNS C51000

1. SCOPE:

1.1 Form: This specification covers one type of bronze in the form of bars, rods, and tubing.

1.2 Application: Primarily for parts, such as bushings and bearings, requiring low coefficient of friction, moderate strength, and good electrical conductivity.

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 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 2221 - Tolerances, Copper and Copper Alloy Bars and Rods
MAM 2221 - Tolerances, Metric, Copper and Copper Alloy Bars and Rods
AMS 2223 - Tolerances, Copper and Copper Alloy Seamless Tubing
MAM 2223 - Tolerances, Metric, Copper and Copper Alloy Seamless Tubing
AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from ASTM, 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 B249M - General Requirements for Wrought Copper and Copper-Alloy Rod, Bar, and Shapes (Metric)
ASTM B251 - General Requirements for Wrought Seamless Copper and Copper-Alloy Tube
ASTM B251M - General Requirements for wrought Seamless Copper and Copper-Alloy Tube (Metric)
ASTM E8 - Tension Testing of Metallic Materials
ASTM E8M - Tension Testing of Metallic Materials (Metric)
ASTM E54 - Chemical Analysis of Special Brasses and Bronzes

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 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, Ø determined by wet chemical methods in accordance with ASTM E54, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

	min	max
Tin	4.2	5.8
Phosphorus	0.03	0.35
Zinc	--	0.30
Iron	--	0.10
Lead	--	0.05
Copper + Sum of Named Elements (3.1.2)	99.5	--
Copper (3.1.1)	remainder	

3.1.1 Applicable when copper is not determined by analysis. The reported Ø (certified) value is the difference between the sum of all other specified elements and 100% and will, therefore, include unnamed elements. Limits for unnamed elements may be established by agreement between purchaser and manufacturer.

3.1.2 Applicable only when copper is determined by direct analysis. Ø

3.2 Condition: Cold finished, hard temper (H04) (See 8.2).

3.3 Properties: The product shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as specified in Table I, determined in Ø accordance with ASTM E8 or ASTM E8M.

TABLE I

Nominal Diameter or Distance Between Parallel Sides Inches	Tensile Strength psi, minimum	Elongation in 4D %, minimum
Rounds		
Up to 0.25, excl	80,000	12
Rounds and Hexagons		
0.25 to 0.50, incl	70,000	13
Over 0.50 to 1.00, incl	60,000	20
Over 1.00	55,000	18
Squares and Rectangles Nominal Thickness		
Up to 0.375, incl	60,000	10
Over 0.375	55,000	15
Tubing, Nominal OD		
Over 1.00	55,000	12

TABLE I (SI)

Nominal Diameter or Distance Between Parallel Sides Millimetres	Tensile Strength MPa, minimum	Elongation in 4D %, minimum
Rounds		
Up to 6.4, excl	552	12
Rounds and Hexagons		
6.4 to 12.7, incl	483	13
Over 12.7 to 25.4, incl	414	20
Over 25.4	379	18
Squares and Rectangles Nominal Thickness		
Up to 9.52, incl	414	10
Over 9.52	379	15
Tubing, Nominal OD		
Over 25.4	379	12

3.3.2 Embrittlement: Specimens as in 4.3.4 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 imperfections detrimental to usage of the product.

3.5 Tolerances: Shall conform to the following:

3.5.1 Bars and Rods: AMS 2221 or MAM 2221 as applicable to refractory alloys.

3.5.2 Tubing: AMS 2223 or MAM 2223 as applicable to refractory alloys.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all Ø 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 product conforms to the requirement of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical Ø requirements of this specification are classified as acceptance tests and shall be performed on each lot.

4.3 Sampling: Shall be in accordance with the following:

4.3.1 Bars and Rods: ASTM B249 or ASTM B249M.

4.3.2 Tubing: ASTM B251 or ASTM B251M.

4.3.3 The axis of tensile specimens shall be located approximately midway between center and surface of bars and rods over 1.50 inches (38.1 mm) in nominal diameter or distance between parallel sides.

4.3.4 Specimens for embrittlement testing shall be full cross-section of the product and shall have length of approximately 6 inches (152 mm) or twice the diameter or least distance between parallel sides, whichever is greater.

4.4 Reports: The vendor of the product shall furnish with each shipment a report showing the results of tests on each lot to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 4625F, size, and quantity.