Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE. WARRENDALE. PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4720C
Superseding AMS 4720B
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UNS C51000

PHOSPHOR BRONZE WIRE
95Cu - 4.6Sn - 0.19P (CDA 510)
Spring Temper

1. SCOPE:

1.1 Form: This specification covers one type of bronze in the form of round wire 0.500 in. (12.70 mm) and under in nominal diameter.

1.2 Application: Primarily for springs.

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 Society of Automotive Engineers, Inc., 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

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 E54 - Chemical Analysis of Special Brasses and Bronzes
ASTM E290 - Semi-Guided Bend Test for Ductility of Metallic Materials

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 E54, by spectrographic methods in accordance with Federal Ø Test Method Standard No. 151, Method 112, or by other approved analytical methods:

	min	max
Copper (3.1.1)	93.0	--
Tin (3.1.1)	3.5	5.8
Phosphorus (3.1.1)	0.03	0.35
Zinc	--	0.30
Iron	--	0.10
Lead	--	0.05

3.1.1 Copper + tin + phosphorus shall be not lower than 99.5%.

3.2 Condition: Cold-drawn, spring temper.

3.3 Properties: Wire shall conform to the following requirements:

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

TABLE I

Nominal Diameter Inch	Tensile Strength psi, min	Elongation in 2 in. %, min
Up to 0.025, incl	145,000	--
Over 0.025 to 0.063, incl	135,000	--
Over 0.063 to 0.125, incl	130,000	--
Over 0.125 to 0.250, incl	125,000	--
Over 0.250 to 0.375, incl	120,000	5
Over 0.375 to 0.500, incl	105,000	9

TABLE I (SI)

Nominal Diameter Millimetres	Tensile Strength MPa, min	Elongation in 50 mm %, min
Up to 0.64, incl	1000	--
Over 0.64 to 1.60, incl	931	--
Over 1.60 to 3.18, incl	896	--
Over 3.18 to 6.35, incl	862	--
Over 6.35 to 9.52, incl	827	5
Over 9.52 to 12.70, incl	724	9

3.3.2 Bending: Wire 0.250 in. (6.35 mm) and under in nominal diameter shall withstand, without cracking, bending in accordance with ASTM E290 through an angle of 120 deg around a diameter equal to twice the nominal diameter of the wire.

3.3.2.1 Bending requirements for wire over 0.250 in. (6.35 mm) to 0.500 in. (12.70 mm), incl, in nominal diameter shall be as agreed upon by purchaser and vendor.

3.4 Quality: Wire, 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 wire.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to AMS 2224 as applicable to nonrefractory alloys.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of wire 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 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 lot of wire.

4.3 Sampling: Shall be in accordance with ASTM 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 on each lot to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, lot number, material specification number and its revision letter, nominal size, and quantity.

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, material specification number and its revision letter, 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 a statement that the wire conforms, or shall include 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 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 and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Wire shall be supplied on spools or in coils except when straight lengths are ordered.