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

AEROSPACE MATERIAL SPECIFICATION

AMS 4520F
Superseding AMS 4520E

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UNS C54400

BRONZE STRIP
89Cu - 4.0Sn - 4.0Pb - 3.0Zn (CDA 544)

1. SCOPE:

1.1 Form: This specification covers one type of phosphor bronze in the form of strip.

1.2 Application: Primarily for rolled split bushings.

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 2222 - Tolerances, Copper and Copper Alloy Sheet, Strip, and Plate
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 B248 - General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar
ASTM E8 - Tension Testing of Metallic Materials
ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E478 - Chemical Analysis of Copper 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	86.7	--
Tin	3.5	- 4.5
Ø Lead	3.5	- 4.5
Zinc	1.5	- 4.5
Phosphorus	0.01	- 0.50
Iron	--	0.10
Other Elements, each	--	0.05
Other Elements, total	--	0.15

Ø 3.2 Condition: Cold rolled, half hard temper.

3.3 Properties: Strip shall conform to the following requirements:

Ø 3.3.1 Elongation: Shall be not lower than 16% in 2 in. (50 mm), determined in accordance with ASTM E8.

Ø 3.3.2 Hardness: Shall be 72 - 79 HRB or equivalent, determined in accordance with ASTM E18.

3.4 Quality: Strip, as received by purchaser, shall be uniform in quality and condition, sound, and Ø free from foreign materials and from internal and external imperfections detrimental to usage of the strip.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to AMS 2222 as applicable to nonrefractory alloys.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of strip shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as re- Ø quired by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the strip conforms to the requirements of this specification.

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

Ø 4.3 Sampling: Shall be in accordance with ASTM B248.

4.4 Reports:

4.4.1 The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the chemical composition, elongation, and hardness Ø of each lot. This report shall include the purchase order number, lot number, material specification number and its revision letter, 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 strip, part number, and quantity. When strip for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of strip to determine conformance to the requirements of this specification, and shall include in the report a statement that the strip 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 strip may be based on the results of testing three additional specimens for ø each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the strip represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each strip shall be identified as in 5.1.1 unless line marking as in 5.1.2 is specified by purchaser.

5.1.1 Each strip shall be marked near one end, coils being marked near the outside end, with AMS 4520F, lot number, manufacturer's identification, and nominal thickness, using any suitable marking fluid. ø As an alternate method, individual pieces or bundles shall have attached a durable tag marked with the above information or shall be boxed and the box marked with the same information.

5.1.2 When specified by purchaser, each strip shall be marked on one face in the respective location indicated below, with AMS 4520F, lot number, manufacturer's identification, and nominal thickness. The characters shall be of such size as to be clearly legible, shall be applied using a suitable marking ø fluid, and shall be removable in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the strip or its performance and shall be sufficiently stable to withstand normal handling. The specification number, manufacturer's identification, and nominal thickness shall be continuously line marked; the lot number may be included in the line marking, or may be marked at one location on each piece.

5.1.2.1 Flat Strip 6 In. (152 mm) and Under in Width: Shall be marked in one or more lengthwise rows ø of characters recurring at intervals not greater than 3 ft (914 mm).

5.1.2.2 Flat Strip Over 6 In. (152 mm) in Width: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 ft (914 mm), the rows being spaced not more than 6 in. (152 mm) ø apart and alternately staggered.

5.1.2.3 Coiled Strip: Shall be marked near both the outside and inside ends of the coil; the markings shall be applied as in 5.1.2 or shall appear on a durable tag or label attached to the coil and marked ø with the information of 5.1.2. When the inside end of the coil is inaccessible, as when the strip is wound on cores, the tag or label may be attached to the core.

5.2 Packaging:

5.2.1 Strip shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the strip ø to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

5.2.2 For direct U.S. Military procurement, packaging shall be in accordance with MIL-C-3993, Level A ø or Level C, as specified in the request for procurement. Commercial packaging as in 5.2.1 will be acceptable if it meets the requirements of Level C.