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The Engineering Society For Advancing Mobility Land Sea Air and Space®

400 Commonwealth Dr., Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 4820D

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Superseding AMS 4820C

BEARINGS, LEADED COPPER
70Cu - 28.5Pb
Steel Back

UNS C98400

1. SCOPE:

1.1 Form: This specification covers bearings of leaded copper cast on one or both faces of a steel backing.

1.2 Application: Primarily for shims, thrust washers, bushings, and bearings.

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 2350 - Standards and Test Methods
AMS 2370 - Quality Assurance Sampling of Carbon and Low-Alloy Steels, Wrought Products Except Forgings and Forging Stock
AMS 2800 - Identification, Finished Parts

2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103.

ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E478 - Chemical Analysis of Copper 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 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

3.1.1 Bearing Metal: Shall conform to the following percentages by weight, 0 determined by wet chemical methods in accordance with ASTM E478, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

	min	max
Lead	26.0	33.0
Silver	--	1.5
Iron	--	0.7
Zinc	--	0.50
Tin	--	0.50
Nickel	--	0.50
Antimony	--	0.50
Phosphorus	--	0.10
Copper + Sum of Named Elements (3.1.1.2)	99.5	--
Copper (3.1.1.1)	remainder	

3.1.1.1 Applicable when copper is not determined by analysis. The reported 0 (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.

3.1.1.2 Applicable only when copper is determined by direct analysis.

3.1.2 Backing: Shall be a low-carbon steel.

3.2 Condition: Shall be a composite material produced by casting leaded copper onto one or both faces of a steel backing.

3.3 Properties: Bearings shall conform to the following requirements:

3.3.1 Hardness: Steel backing shall have hardness not higher than 78 HR15N, or equivalent, determined in accordance with ASTM E18.

3.3.2 Cladding Structure: Shall be free of excessive lead segregation. Methods of testing and standards for acceptance shall be as agreed upon by purchaser and vendor.

3.4 Quality: Bearings, 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 bearings.

3.4.1 Cladding shall be firmly and continuously bonded to the steel backing, determined by a procedure agreed upon by purchaser and vendor

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of bearings 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 4.5. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the bearings conform 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 as preproduction tests and shall be performed prior to or on the first-article shipment of a bearing to a purchaser, on each lot, when a change in material and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling: Shall be in accordance with the following; a lot shall be all parts of one size and configuration made from a single heat of steel backing and a single heat of bearing metal processed in one continuous run and presented for vendor's inspection at one time:

4.3.1 Steel Backing: AMS 2370

4.3.2 Bearing Metal: Two samples from each heat of alloy melted at the same

4.3.3 Bearings: Three samples from each lot.

4.4 Approval:

4.4.1 Sample bearings shall be approved by purchaser before bearings for production use are supplied, unless such approval be waived by purchaser.

4.4.2 Vendor shall use materials, manufacturing procedures, processes, and methods of inspection on production bearings which are essentially the same as those used on the approved sample bearings. If necessary to make any change in materials, manufacturing procedures, or processing, vendor shall submit for reapproval a statement of the proposed changes in material and/or processing and, when requested, sample bearings. Production bearings made by the revised procedure shall not be shipped prior to receipt of reapproval.