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400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4824B
Superseding AMS 4824A

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BEARINGS, BABBITT-COATED LEADED-BRONZE
Steel Back

1. SCOPE:

1.1 Form: This specification covers bearings of a leaded bronze cast on one or both faces of a steel backing with a layer of babbitt metal cast on the leaded bronze.

1.2 Application: Primarily for bushings and bearings.

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

ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E57 - Chemical Analysis of White Metal Bearing Alloys
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 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Standards:

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

Printed in U.S.A.

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

3.1.1 Babbitt Metal: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E57, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

	min	max
Tin	86.0	--
Antimony	6.0	7.5
Copper	5.0	6.5
Lead	--	0.35
Tellurium	--	0.15
Arsenic	--	0.10
Iron	--	0.08
Bismuth	--	0.08

3.1.2 Leaded Bronze: 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 analytical methods approved by purchaser:

	min	max
Copper	72.0	77.0
Lead	22.0	26.0
Tin	1.0	1.5
Iron	--	0.35
Silver	--	0.20
Zinc	--	0.10
Nickel	--	0.01
Phosphorus	--	0.01
Other Elements, total	--	0.20

3.1.3 Backing: Shall be a low-carbon steel.

3.2 Condition: Shall be a composite material, produced by casting leaded bronze onto one or both faces of the steel back, and then casting babbitt metal onto the leaded bronze.

3.3 Properties: Bearings shall conform to the following requirements:

3.3.1 Hardness of Back: Shall be not higher than 75 HR15N or equivalent, determined in accordance with ASTM E18.

3.3.2 Structure of Leaded-Bronze: Shall be free from 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 internal and external imperfections detrimental to usage of the bearings.

3.4.1 The leaded bronze shall be firmly and continuously bonded to the back and the babbitt metal shall be firmly and continuously bonded to the leaded bronze, 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:

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

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed on the first-article shipment of a bearing to a purchaser, when a change in material or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 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, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be in accordance with the following, a lot shall be all bearings of one size and configuration made from a single heat of steel backing, a single heat of leaded bronze and a single heat of babbitt metal processed in one continuous run and submitted for vendor's inspection at one time.

4.3.1 Steel Back: In accordance with AMS 2370.

4.3.2 Leaded Bronze: Two samples from each heat of material melted at the same time.

4.3.3 Babbitt Metal: Two samples from each heat of material melted at the same time.

4.3.4 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 or processing, and, when requested, sample bearings. Production bearings made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports: The vendor of bearings shall furnish with each shipment three copies of a report stating that the bearings conform to the chemical composition, condition, and other technical requirements of this specification. This report shall include the purchase order number, AMS 4824B, part number, lot number, and quantity.

4.6 Resampling and Retesting: If any part or specimen used in the above tests fails to meet the specified requirements, disposition of the parts may be based on the results of testing three additional parts or specimens for each original nonconforming specimen. Failure of any retest part or specimen to meet the specified requirements shall be cause for rejection of the parts represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Bearings shall be identified in accordance with AMS 2800.