SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS4805 REV. E

Issued 1941-09
Revised 1986-10
Noncurrent 2007-04
Reaf Nonc 2012-09

Superseding AMS4805D

Bearings, Sintered Metal Powder 89Cu - 10Sn Oil Impregnated

RATIONALE

AMS4805E has been reaffirmed to comply with the SAE five-year review policy.

NONCURRENT NOTICE

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of April, 2007. It is recommended, therefore, that this specification not be specified for new designs.

"NONCURRENT" refers to those specifications which have previously been widely used and which may be required for production or processing of existing designs in the future. The Aerospace Materials Division, however, does not recommend these specifications for future use in new designs. "NONCURRENT" specifications are available from SAE upon request.

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http://www.sae.org/technical/standards/AMS4805E

1. SCOPE:

1.1 Form: This specification covers one type of sintered metal powder in the form of oil-impregnated bearings.

1.2 Application: Primarily for bearings requiring self-lubrication, low coefficient of friction, and accurate dimensions.

2. APPLICABLE DOCUMENTS: The following publications form a part for this specification to the extent specified herein, The lastest issue of Aerospace Material Specifications 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 2800 - Identification, Finished Parts

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B438 - Sintered Bronze Bearings (Oil Impregnated)
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 (Oil-Free Basis): Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E478 or by spectrographic or other analytical methods approved by purchaser:

	min	max
Copper	87.5	90.5
Tin	9.5	10.5
Graphite	--	1.5
Other Elements, total	--	0.50

3.2 Condition: Supplied impregnated with a high-grade, non-gumming petroleum oil.

3.3 Properties: Bearings shall conform to the following requirements:

3.3.1 Specific Gravity: Shall be 6.4 - 6.8, determined at 68°F ± 2 (20°C ± 1) on bearings as supplied fully impregnated with oil.

3.3.2 Oil Absorption: Bearings, heated to 300°F ± 10 (150°C ± 5) and held at heat for 4 - 5 min., shall exude uniformly a film or beads of oil from the bearing surface.

3.3.3 Radial Crushing Strength: Shall not be lower than the value calculated from the following equation:

$$P = \frac{KLT^2}{D-T}$$

P = Calculated radial crushing strength in pounds (N)
K = 22,500 psi (155 MPa)
L = Length of bearing in in. (mm)
T = Bearing wall thickness in in. (mm)
D = Outside diameter of bearing in in. (mm)

3.3.3.1 Radial crushing strength shall be determined by compressing the test specimen between two flat surfaces, with a load applied perpendicular to the longitudinal axis of the specimen. The maximum load shall be considered the crushing strength value. This test applies to plain cylindrical bearings. Flanged bearings shall be tested by cutting off the flange and compressing the two sections separately.

3.3.3.2 Bearings shall not be brittle and shall take a permanent deformation without fracture when compressed under a gradually applied load or bent by suitable means.

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.

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, processing, or both 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 bearings 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 ASTM P438.

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 manufacturing procedures, processes, and methods of inspection on production bearings which are essentially the same as those used on approved sample bearings. If necessary to make any change in type of equipment or processing conditions, vendor shall submit for reapproval a statement of the proposed changes in processing and, when requested, sample bearings. Production bearings fabricated 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 a report showing the results of tests for chemical composition, density, and crushing strength. This report shall include the purchase order number, AMS 4805D, part number, and quantity.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Shall be in accordance with AMS 2800.

5.2 Packaging: