SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS7320 REV. F

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Superseding AMS7320E

Rings, Sealing, Cast Leaded-Tin Bronze 80Cu – 16Sn – 5Pb As Cast

(Composition similar to UNS C92800)

RATIONALE

AMS7320F revises analytical standards (3.1) and changes the hardness requirement (3.3.1) to the correct range.

1. SCOPE

1.1 Form

This specification covers a cast leaded-tin bronze in the form of sealing rings.

1.2 Application

This product has been used typically for drilled oil seal rings, but usage is not limited to such product.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM B 824 General Requirements for Copper Alloy Castings

ASTM E 18 Rockwell Hardness of Metallic Materials

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS7320F

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM B 824, section 13 or by spectrochemical or other analytical methods approved by purchaser.

TABLE 1 - COMPOSITION

Element (3.1.1)	min	max
Copper (3.1.2)	78.0	82.0
Tin	15.0	17.0
Lead	4.0	6.0
Copper + Tin + Lead	99.0	--

3.1.1 These composition limits do not preclude the presence of other elements. Limits may be established and analysis required for unnamed elements by agreement between the manufacturer or supplier and the purchaser.

3.1.2 Copper may be reported as the different between the sum of results for all elements in the table are analyzed, the sum shall be 99.0% minimum, but such determination is not required for routine acceptance of each lot.

3.2 Condition

As cast.

3.2.1 Rings shall be finished all over. Periphery shall be turned smooth; ID shall be turned smooth or ground, and sides shall be ground or lapped. Markings resultant from hammering or rolling operations will be acceptable.

3.3 Properties

Rings shall conform to the following requirements:

3.3.1 Hardness

Shall be 72-82 HRB, or equivalent (See 8.2), determined in accordance with ASTM E 18.

3.3.2 Light-Tightness of Periphery

A ring, placed in a circular gage having ID equal to the gage diameter of the ring ±0.0005 inch (±0.012 mm), shall have not less than 85% of the ring periphery light-tight, fuzzy light being considered as light-tight. A ring shall be rendered 100% light-tight by application of a radial load not greater than 5 pounds (22 N) to the ID of the ring. Light source shall be a 40-watt lamp.

3.4 Quality

Rings, as received by purchaser, shall be uniform in qality and condition, clean, sound, and free from foreign materials and from conditions detrimental to their performance.

3.5 Tolerances

Rings shall conform to the following tolerances:

3.5.1 Squareness of Periphery

The ring periphery shall be square with the sides within 0.0005 inch (0.012 mm).

3.5.2 Wall Thickness

Shall be within the limits specified on the drawing but shall vary not more than 0.004 inch (0.10 mm) throughout the circumference of any one ring.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of rings shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the rings conform to specified requirements.

4.2 Classification of Tests

All technical requirements are acceptance tests and as preproduction tests and shall be performed prior to or on the first-article shipment of a ring to a purchaser, on each lot, when a change in material, processing, or both require reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing

Shall be in accordance with the following: A lot shall be all rings of one size from the same melt of alloy presented for vendor's inspection at one time.

4.3.1 Composition

One ring from each lot.

4.3.2 Hardness

Five rings or more from each lot.

4.3.3 Light-Tightness of Periphery

One or more rings from each lot.

4.3.4 Tolerances

One or more rings from each lot.

4.4 Approval

4.4.1 Sample rings shall be approved by purchaser before rings 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 rings which are essentially the same as those used on the approved sample rings. If necessary to make any change in manufacturing procedures of processes, vendor shall submit for re-approval a statement of the proposed changes in operations and, when requested, sample rings. Production rings incorporating the revised operations shall not be shipped prior to receipt of re-approval.

4.5 Reports

The vendor of rings shall furnish with each shipment a report stating that the product conforms to the composition and tolerances, and showing the numerical results of tests on each inspection lot to determine conformance to the other technical requirements. This report shall include the purchase order number, lot number, AMS7320F, part number, size of rings or section identification number and quantity. The report shall also report the identity of the manufacturer.

4.6 Resampling and Retesting

If any specimen used in the above tests fails to meet the specified requirements, disposition of the rings may be based on the results of testing two additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the rings represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY

5.1 Identifications and Packaging

5.1.1 Rings shall be packaged in such a manner as to ensure that the rings, during shipment and storage, will be protected against mechanical injury.

5.1.2 Each package of rings shall be marked with not less than the following information:

Rings, sealing, cast tin bronze
AMS7320F
Part number
Lot number
Purchase order number
Quantity
Manufacturer's identification

5.1.3 Packages of rings 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 rings to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchaser orders.

7. REJECTIONS

Rings not conforming to this specification or to modifications authorized by purchaser will be subject to rejection.

8. NOTES

8.1 A change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 Hardness conversion tables for metals are presented in ASTM E 140.

8.3 Terms used in AMS are clarified in ARP1917.