AEROSPACE MATERIAL SPECIFICATION

AMS7320™	REV. H

Issued 1940-10
Reaffirmed 2010-05
Revised 2024-10

Superseding AMS7320G

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

(Composition similar to UNS C92800)

RATIONALE

AMS7320H results from a Five-Year Review and update of this specification with changes to clarify that casting approval is the responsibility of the cognizant engineering organization (see 4.2 and 4.4), update general agreement language to prohibit unauthorized exceptions (see 8.4), relocate Definitions (see 2.3), and update Applicable Documents (see Section 2), Composition (see 3.1), Hardness (see 3.3.1), and Ordering Information (see 8.5).

1. SCOPE

1.1 Form

This specification covers a cast leaded-tin bronze in the form of sealing rings (see 8.5).

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 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AS7766 Terms Used in Aerospace Metals Specifications

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**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS7320H/

2.2 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 E18 Rockwell Hardness of Metallic Materials

ASTM E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

ASTM E478 Chemical Analysis of Copper Alloys

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM E478 or other analytical methods approved by the purchaser (see 8.5).

Table 1 - Composition

Element (see 3.1.1)	Min	Max
Copper (see 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 the supplier and the purchaser (see 8.5).

3.1.2 Copper may be reported as “remainder,” as the difference between the sum of results for all elements and 100%, or as the result of direct analysis.

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 to 82 HRB determined in accordance with ASTM E18.

3.3.2 Light-Tightness of Periphery

A ring, placed in a circular gauge having ID equal to the gauge diameter of the ring ±0.0005 inch (±0.012 mm), shall have not less than 85% of the ring periphery light-tight, with 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. The light source shall be a 40-W lamp.

3.4 Quality

Rings, as received by the purchaser, shall be uniform in quality 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.

3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.5.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of rings shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The 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, 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 by the cognizant engineering organization as in 4.4.2, and when a purchaser and/or cognizant engineering organization 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 the producer'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 the cognizant engineering organization before rings for production use are supplied, unless such approval is waived by the cognizant engineering organization.

4.4.2 The producer shall use manufacturing procedures, processes, and methods of inspection on production rings that are essentially the same as those used on the approved sample rings. If necessary to make any change in manufacturing procedures or processes, the producer shall submit for reapproval a statement of the proposed changes in operations to the cognizant engineering organization and, when requested, sample rings. Production rings incorporating the revised operations shall not be shipped prior to receipt of reapproval by the cognizant engineering organization.

4.5 Reports

The producer 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, AMS7320H, part number, size of rings or section identification number, and quantity. The report shall also report the identity of the manufacturer.

4.5.1 When rings produced to this specification have exceptions authorized by the purchaser taken to the technical requirements listed in Section 3 (see 5.1.3), the report shall contain a statement “This material is certified as AMS7320H(EXC) because of the following exceptions:” and the specific exceptions shall be listed.

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 Identification 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
AMS7320H
Part number
Lot number
Purchase order number
Quantity
Manufacturer’s identification

5.1.3 When technical exceptions are taken (see 4.5.1), the material shall be marked with AMS7320H(EXC).