SAE Aerospace
An SAE International Group

# AEROSPACE MATERIAL SPECIFICATION

SAE AMS4614 REV. H

Issued 1940-10
Revised 2003-12
Reaffirmed 2012-02

Superseding AMS4614G

## Brass Forgings, Free Cutting
## 60Cu - 2.0Pb - 37.5Zn
## As Forged (M10)

(Composition similar to UNS C37700)

RATIONALE

AMS4614H has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Form:

This specification covers one type of brass in the form of forgings and forging stock.

1.2 Application:

These forgings have been used typically for forged fittings, such as elbows, tees, and manifolds in fluid conducting systems.

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, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2808 Identification, Forgings

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM E 10 Brinell Hardness of Metallic Materials
ASTM E 478 Chemical Analysis of Copper Alloys





**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/AMS4614H**

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 478, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

TABLE 1 - Composition

| Element (3.1.1) | min | max |
|---|---|---|
| Copper | 58.0 | 62.0 |
| Lead | 1.5 | 2.5 |
| Iron | -- | 0.30 |
| Zinc | | (See 3.1.2) |
| Sum of Named Elements (3.1.3) | 99.5 | -- |

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 purchaser.

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

3.1.3 When all named elements in Table 1 are analyzed, the sum shall be 99.5% minimum, but such determination is not required for routine acceptance of each lot.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Forgings: As forged (M10) temper (See 8.2).

3.2.2 Forging Stock: As ordered by the forging manufacturer.

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Forgings: Shall have hardness of 70 to 120 HB/10/1000/30, or equivalent, determined in accordance with ASTM E 10.

3.3.2 Forging Stock: As agreed upon by purchaser and vendor.

3.4 Quality:

The product, 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 product.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product 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 product conforms to specified requirements.

4.2 Acceptance Tests:

All technical requirements of this specification are acceptance tests and shall be performed on each lot.

4.3 Sampling and Testing:

Shall be as follows; a lot shall be all forgings of the same size and shape or not more than 10,000 pounds (4536 kg) of forging stock of the same size and shape produced in a continuous run and presented for vendor's inspection at one time.

4.3.1 Composition: One sample from each lot.

4.3.2 Hardness: 10% of the forgings in each lot.

4.4 Reports:

4.4.1 The vendor of forgings shall furnish with each shipment a report showing the results of tests for chemical composition and hardness of each lot. This report shall include the purchase order number, lot number, AMS 4614H, size and melt source of forging stock, size or part number of forgings, and quantity.

4.4.2 The vendor of forging stock shall furnish with each shipment a report stating that the stock conforms to the chemical composition requirements. This report shall include the purchase order number, lot number, AMS 4614H, size, and quantity.

4.5 Resampling and Retesting:

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

5. PREPARATION FOR DELIVERY:

5.1 Identification:

Shall be as follows:

5.1.1 Forgings: In accordance with AMS 2808.

5.1.2 Forging Stock: As agreed upon by purchaser and vendor.

5.2 Packaging:

The product 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 product 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 purchase orders.

7. REJECTIONS:

Product 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 specification. An (R) symbol to the left of the document title indicates a complete revision of the specification, including technical revisions. Change bars and (R) are not used in original publications, nor in specifications that contain editorial changes only.

8.2 Terms used in AMS are clarified in ARP1917.

8.3 Dimensions and properties in inch/pound units and Fahrenheit temperatures are primary; dimensions and properties in SI units and Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.4 Copper temper designations are defined in ASTM B 601.

8.5 Purchase documents should specify not less than the following

AMS 4614H
Form and size or part number of product desired
Quantity of product desired.