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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4635D

Issued NOV 1941
Revised APR 1990
Reaffirmed OCT 2000

Superseding AMS 4635C

Aluminum Bronze Bars, Rods, and Forgings
87Cu - 9Al - 3Fe
Stress Relieved

UNS C62300

1. SCOPE:

1.1 Form:

This specification covers one type of aluminum bronze in the form of bars, rods, forgings, and forging stock.

1.2 Application:

Primarily for parts requiring strength and corrosion resistance at moderate temperatures.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

2.1.1 Aerospace Material Specifications:

AMS 2221	Tolerances, Copper and Copper Alloy Bars and Rods
MAM 2221	Tolerances, Metric, Copper and Copper Alloy Bars and Rods
AMS 2375	Control of Forgings Requiring First-Article Approval
AMS 2808	Identification, Forgings

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia PA 19103-1187.

ASTM B 249	General Requirements for Wrought Copper and Copper-Alloy Rod, Bar, and Shapes
ASTM B 249M	General Requirements for Wrought Copper and Copper-Alloy Rod, Bar, and Shapes (Metric)
ASTM E 10	Brinell Hardness of Metallic Materials
ASTM E 478	Chemical Analysis of Copper Alloys

2.3 U.S. Government Publications:

Available from Naval Publications and Forms Center, Attn: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099.

2.3.1 Military Specifications:

MIL-C-3993 Copper and Copper-Base Alloy Mill Products, Packaging of

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

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

	min		max
Aluminum	8.5	-	10.0
Iron	2.0	-	4.0
Nickel (including Cobalt)	- -		1.0
Tin	- -		0.6
Manganese	- -		0.50
Silicon	- -		0.25
Copper + Sum of Named Elements (3.1.2)	99.5		- -
Copper (including Silver) (3.1.1)	remainder		

3.1.1 Applicable when copper is not determined by analysis. The reported (certified) value is the difference between the sum of all other specified elements and 100% and will, therefore, include unnamed elements. Limits for unnamed elements may be established by agreement between purchaser and manufacturer.

3.1.2 Applicable only when copper is determined by direct analysis.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Bars and Rods: As rolled or extruded and stress relieved.

3.2.2 Forgings: Stress relieved (M12) (See 8.2).

3.2.3 Forging Stock: As ordered by the forging manufacturer.

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Bars, Rods and Forgings:

3.3.1.1 Hardness: Shall be 155 - 190 HB/10/1000, or equivalent, determined in accordance with ASTM E 10 on the surface except on rounds where a flat, as necessary for accuracy, may be made.

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.

3.5 Tolerance:

Bars and rods shall conform to AMS 2221 or MAM 2221 as applicable to refractory alloys.

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 performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

Tests for all technical requirements are acceptance tests and shall be performed on each lot.

4.3 Sampling and Testing:

Shall be in accordance with the following:

4.3.1 Bars and Rods: ASTM B 249 or ASTM B 249M.

4.3.2 Forgings and Forging Stock: As agreed upon by purchaser and vendor.

4.4 Reports:

4.4.1 The vendor of bars, rods, and 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 4635D, size, and quantity. If forgings are supplied, the part number and the size and melt source of stock used to make the forgings shall also be included.

4.4.2 The vendor of forging stock shall furnish with each shipment a report showing the results of tests for chemical composition of each lot. This report shall include the purchase order number, lot number, AMS 4635D, 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 and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

Shall be as follows:

5.1.1 Bars and Rods: Individual pieces or bundles shall have attached a durable tag or label marked with the purchase order number, AMS 4635D, lot number, and nominal size or shall be boxed and the box marked with the same information.

5.1.2 Forgings: In accordance with AMS 2808.

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