SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 4675C

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Reaffirmed MAY 2008

Superseding AMS 4675B

Nickel-Copper Alloy, Corrosion Resistant, Bars and Forgings
67Ni - 30Cu

(Composition similar to UNS N04400)

1. SCOPE:

1.1 Form:

This specification covers a corrosion-resistant nickel-copper alloy in the form of bars, forgings, and forging stock.

1.2 Application:

These products have been used typically for fittings, such as cones, nipples, and unions, in fluid line assemblies using AMS 4574 or AMS 4575 tubing, but usage is not limited to such applications.

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 2261	Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy, Bars, Rods, and Wire
AMS 2269	Chemical Check Analysis Limits, Nickel, Nickel Alloys, and Cobalt Alloys
AMS 2371	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS 2374	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steel and Alloy Forgings

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

2.1 (Continued):

AMS 2806 Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat-Resistant Steels and Alloys
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 8 Tension Testing of Metallic Materials
ASTM E 8M Tension Testing of Metallic Materials (Metric)
ASTM E 18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 76 Chemical Analysis of Nickel-Copper Alloys

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 76, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.30
Manganese	--	2.00
Silicon	--	0.50
Copper	28.00	34.00
Iron	--	2.50
Nickel	remainder	

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2269.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Bars: Cold drawn and stress relieved by heating to a temperature within the range 1000° to 1100 °F (538° to 593 °C), holding at the selected temperature within ±25 °F (±14 °C) for 1 hour ±0.25, and cooling at a rate equivalent to cooling in air.

3.2.2 Forgings: As forged.

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 Tensile Properties: Shall be as follows, determined in accordance with ASTM E 8 or ASTM E 8M:

3.3.1.1 Round Bars: Shall be as shown in Table 2.

TABLE 2A - Minimum Tensile Properties, Inch/Pound Units

Nominal Diameter Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 4D %
0.093 to 0.500, excl	84	50	10
0.500 to 3.500, incl	87	60	22
Over 3.500 to 4.000, incl	84	55	25

TABLE 2B - Minimum Tensile Properties, SI Units

Nominal Diameter Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 4D %
2.35 to 12.50, excl	579	345	10
12.50 to 87.50, incl	600	414	22
Over 87.50 to 100.00, incl	579	379	25

3.3.1.2 Hexagonal, Square, and Rectangular Bars: Shall be as shown in Table 3.

TABLE 3A - Minimum Tensile Properties, Inch/Pound Units

Nominal Distance Between Parallel Sides Inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 4D %
0.093 to 0.500, incl	84	50	10
0.500 and over	84	50	22

TABLE 3B - Minimum Tensile Properties, SI Units

Nominal Distance Between Parallel Sides Millimeters	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa	Elongation in 4D %
2.35 to 12.50, excl	579	345	10
12.50 and over	579	345	22

3.3.2 Hardness:

3.3.2.1 Bars: Should be not lower than the values shown, or equivalent (See 8.2), determined in accordance with ASTM E 18. Product shall not be rejected on the basis of hardness if the tensile properties of Table 2 or Table 3 are acceptable, determined on specimens taken from the same sample as that with nonconforming hardness or from another sample with similar nonconforming hardness.

	Maximum Hardness, HRB
Rounds	84
Hexagons, Squares, and Rectangles	80

3.3.2.2 Forgings: Shall have hardness of 78 to 96 HRB, or equivalent (See 8.2), determined in accordance with ASTM E 18.

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.

3.4.1 Grain flow of die forgings, except in areas which contain flash-line end grain, shall follow the general contour of the forgings showing no evidence of reentrant grain flow.

3.5 Tolerances:

3.5.1 Bars shall conform to all applicable requirements of AMS 2261.

3.5.2 Tolerances for forgings and forging stock shall be as acceptable to purchaser.

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.