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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5715C

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Superseding AMS 5715B

Submitted for recognition as an American National Standard

NICKEL ALLOY, CORROSION AND HEAT RESISTANT, BARS, FORGINGS, AND RINGS
60.5Ni - 23Cr - 14Fe - 1.4Al
Annealed

UNS N06601

1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat resistant nickel alloy in the form of bars, forgings, flash welded rings, and stock for forging or flash welded rings.

1.2 Application:

These products have been used typically for parts requiring corrosion and oxidation resistance up to 2200 °F (1204 °C) and where such parts may require welding during fabrication, but usage is not limited to such applications.

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.

AMS 2261 Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Bars, Rods, and Wire
MAM 2261 Tolerances, Metric, Nickel, Nickel Alloy, and Cobalt Alloy Bars, Rods, and Wire
AMS 2269 Chemical Check Analysis Limits, Wrought 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

2.1 SAE Publications: (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
AMS 7490 Rings, Flash Welded, Corrosion and Heat Resistant Austenitic Steels and Austenitic-Type Alloys, or Precipitation Hardenable Alloys

2.2 ASTM Publications:

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

ASTM E 8 Tension Testing of Metallic Materials
ASTM E 8M Tension Testing of Metallic Materials (Metric)
ASTM E 354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

2.3 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

(R)

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 354, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	--	0.10
Manganese	--	1.00
Silicon	--	0.50
Sulfur	--	0.015
Chromium	21.00	25.00
Nickel	58.00	63.00
Aluminum	1.00	1.70
Titanium	--	0.60
Boron	--	0.006
Copper	--	1.00
Iron	remainder	

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

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Bars: Hot finished and annealed; round bars shall be ground or turned.

3.2.2 Forgings and Flash Welded Rings: Annealed.
(R)

3.2.2.1 Flash welded rings shall not be supplied unless specified or permitted on purchaser's part drawing. When supplied, rings shall be manufactured in accordance with AMS 7490.

3.2.3 Stock for Forging or Flash Welded Rings: As ordered by the forging or flash welded ring manufacturer.

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Bars, Forgings, and Flash Welded Rings: Tensile properties of bars, forgings, and flash welded rings 4.00 inches (101.6 mm) and under in least nominal cross section shall be as shown in Table 2, determined in accordance with ASTM E 8 or ASTM E 8M; tensile property requirements for bars, forgings, and flash welded rings over 4.00 inches (101.6 mm) in least nominal cross section shall be as agreed upon by purchaser and vendor.

TABLE 2 - Minimum Tensile Properties

Properties	Value
Tensile Strength	80.0 ksi (552 MPa)
Yield Strength at 0.2% Offset	30.0 ksi (207 MPa)
Elongation in 4D	35%

3.3.2 Forging Stock: When a sample of stock is forged to a test coupon and annealed, specimens taken from the heat treated coupon shall conform to the requirements of 3.3.1. If specimens taken from the stock after annealing conform to the requirements of 3.3.1, the tests shall be accepted as equivalent to tests of a forged coupon.

3.3.3 Stock for Flash Welded Rings: Specimens taken from the stock after annealing shall conform to the requirements of 3.3.1.

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 re-entrant grain flow.

3.5 Tolerances:

Bars shall conform to all applicable requirements of AMS 2261 or MAM 2261.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:
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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:

4.2.1 Acceptance Tests: Tests for composition (3.1), tensile properties (3.3), and tolerances (3.5) are acceptance tests and shall be performed on each heat or lot as applicable:

4.2.2 Periodic Tests: Tests of forging stock (3.3.2) and of stock for flash welded rings (3.3.3) to demonstrate ability to develop required properties are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing:
(R)

Shall be in accordance with the following:

4.3.1 Bars, Flash Welded Rings, and Stock for Forging or Flash Welded Rings: AMS 2371.

4.3.2 Forgings: AMS 2374.

4.4 Reports:

4.4.1 The vendor of bars, forgings, and flash welded rings shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for tensile properties of each lot. This report shall include the purchase order number, heat and lot number, AMS 5715C, annealing temperature used, 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.