

AEROSPACE MATERIAL SPECIFICATION



MAM 5914A

Issued MAY 1995
Cancelled MAR 2003

Superseding MAM 5914

Nickel Alloy, Corrosion and Heat Resistant, Sheet, Strip, and Foil
52.5Ni - 19Cr - 3.0Mo - 5.0Cb - 0.90Ti - 0.50Al - 18Fe
Consumable Electrode or Vacuum induction Melted
Precision Cold Rolled, Solution Heat Treated

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of March, 2003. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications.

AMS 5914 covers the same material.

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1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat resistant nickel alloy in the form of sheet, strip, and foil up to 0.38 millimeters in nominal thickness procured in SI (Metric) units.

1.1.1 AMS 5914 is the inch/pound version of this MAM.

1.2 Application:

These products have been used typically for the fabrication of bellows, diaphragms, and other components requiring a combination of high strength, resistance to heat and corrosion, leak tightness, and maximum fatigue life, 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.

MAM 2262 Tolerances, Metric, Nickel, Nickel Alloy, and Cobalt Alloy Sheet, Strip, and Plate
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

2.2 ASTM Publications:

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

ASTM E 3 Preparation of Metallographic Specimens
ASTM E 8M Tension Testing of Metallic Materials (Metric)
ASTM E 18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 21 Elevated Temperature Tension Tests for Metallic Materials
ASTM E 112 Determining the Average Grain Size
ASTM E 139 Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials
ASTM E 345 Tension Testing of Metallic Foil
ASTM E 354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys
ASTM E 384 Microhardness of Materials
ASTM E 407 Microetching Metals and Alloys

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

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

2.4 ANSI Publications:

Available from American National Standards Institute, Inc., 11 West 42nd Street, New York, NY 10036-8002.

ANSI B46.1 Surface Texture

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

TABLE 1 - Composition

Element	min	max
Carbon	--	0.05
Manganese	--	0.35
Silicon	--	0.35
Phosphorus	--	0.015
Sulfur	--	0.002
Chromium	17.00	21.00
Nickel	50.00	55.00
Molybdenum	2.80	3.30
Columbium	4.75	5.25
Titanium	0.65	1.15
Aluminum	0.20	0.80
Cobalt	--	1.00
Tantalum	--	0.05
Boron	--	0.006
Copper	--	0.30
Lead	--	0.0005 (5 ppm)
Bismuth	--	0.00003 (0.3 ppm)
Selenium	--	0.0003 (3 ppm)
Nitrogen	--	0.01
Iron	remainder	

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

3.2 Melting Practice:

Alloy shall be multiple melted using consumable electrode practice in the remelt cycle. If consumable electrode remelting is not performed in vacuum, electrodes which have been produced by vacuum induction melting shall be used for remelting.

3.3 Condition:

The product shall be supplied in the following condition.

- 3.3.1 Sheet, Strip, and Foil: Solution heat treated, having a surface appearance comparable to a commercial corrosion-resistant steel No. 2B finish (See 8.1), or bright annealed.

3.4 Surface Roughness:

The surface texture shall meet the requirements shown in Table 2, as defined by ANSI B46.1.

TABLE 2 - Maximum Surface Roughness

Nominal Thickness Millimeter	Surface Roughness,RA Microinches□
Up to 0.15, excl	8
0.15 to 0.25, incl	12
Over 0.25 to 0.38, incl	20

3.5 Solution Heat Treatment:

No specific heat treating instructions are specified but it is recommended that the product be solution heat treated by heating in a suitable protective atmosphere to a temperature within the range of 940 to 995 °C, holding at the selected temperature within ± 15 °C for a time commensurate with product thickness, and cooling at a rate equivalent to an air cool or faster.

- 3.5.1 The protective atmosphere shall be hydrogen or argon gas with a dew point of -50°C or lower or a vacuum of 10^{-4} Torr or better.

- 3.5.1.1 The use of dissociated ammonia as a protective atmosphere is not permitted.