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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5540L

Issued JAN 1940
Revised FEB 1995
Reaffirmed AUG 2000

Superseding AMS 5540K

Nickel Alloy, Corrosion and Heat Resistant, Sheet, Strip, and Plate
74Ni - 15.5Cr - 8.0Fe
Annealed

UNS N06600

1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat resistant nickel alloy in the form of sheet, strip, and plate.

1.2 Application:

These products have been used typically for parts requiring oxidation resistance up to 2000 °F (1093 °C), but useful at the higher temperatures only when stresses are low, and where such parts may require welding during fabrication, but usage is not limited to such applications. Strength at elevated temperatures is similar to that of 18-8 type steels.

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 2262	Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Sheet, Strip, and Plate
MAM 2262	Tolerances, Metric, Nickel, Nickel Alloy, and Cobalt Alloy Sheet, Strip, and Plate
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 2807	Identification, Carbon and Low-Alloy Steels, Corrosion and Heat Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

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 E 8	Tension Testing of Metallic Materials
ASTM E 8M	Tension Testing of Metallic Materials (Metric)
ASTM E 112	Determining the Average Grain Size
ASTM E 290	Semi-Guided Bend Test for Ductility of Metallic Materials
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 DODSSP, Subscription Services 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:

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	--	0.15
Manganese	--	1.00
Silicon	--	0.50
Phosphorus	--	0.040
Sulfur	--	0.015
Chromium	14.00	17.00
Nickel	72.00	--
Iron	6.00	10.00
Cobalt	--	1.00
Columbium	--	1.00
Titanium	--	0.50
Tantalum	--	0.05
Aluminum	--	0.35
Copper	--	0.50

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 Sheet and Strip: Hot-rolled or cold-rolled, annealed, and, unless annealing is performed in an atmosphere yielding a bright finish, descaled having a surface appearance comparable to the following commercial corrosion-resistant steel finishes as applicable (See 8.2):

3.2.1.1 Sheet: No. 2D finish

3.2.1.2 Strip: No. 1 strip finish

3.2.2 Plate: Hot rolled, annealed, and descaled

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as specified in Table 2, determined in accordance with ASTM E 8 or ASTM E 8M on product 2.000 inches (50.80 mm) and under in nominal thickness.

TABLE 2 - Minimum Tensile Properties

Property	Value
Tensile Strength	80.0 ksi (552 MPa)
Yield Strength at 0.2% Offset	35.0 ksi (241 MPa)
Elongation in 2 inches (50.8 mm) or 4D	30%

3.3.1.1 Yield strength requirement does not apply to product under 0.020 inch (0.51 mm) in nominal thickness.

3.3.1.2 Elongation requirement does not apply to product under 0.010 inch (0.25 mm) in nominal thickness.

3.3.2 Bending: Product 0.010 to 0.1875 inch (0.25 to 4.762 mm), exclusive, in nominal thickness shall withstand, without cracking, bending in accordance with ASTM E 290 through an angle of 180 degrees around a diameter equal to the bend factor shown in Table 3 times the nominal thickness of the product with axis of bend parallel to the direction of rolling.

TABLE 3 - Bending Parameters

Nominal Thickness Inch	Nominal Thickness Millimeters	Bend Factor
0.010 to 0.050, incl	0.25 to 1.27 , incl	1
Over 0.050 to 0.1875, excl	Over 1.27 to 4.762, excl	2

3.3.3 Average Grain Size: Shall be as shown in Table 4, determined in accordance with ASTM E 112.

TABLE 4 - Grain Size Parameters

Form	Nominal Thickness Inch	Nominal Thickness Millimeters	ASTM Grain Size No.
Sheet	Up to 0.050, incl	Up to 1.27, incl	4.5 or finer
	Over 0.050 to 0.250, incl	Over 1.27 to 6.35, incl	3.5 or finer
Strip	Up to 0.125, incl	Up to 3.18, incl	4.5 or finer

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 Tolerances:

Shall conform to all applicable requirements of AMS 2262 or MAM 2262.

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 heat or lot as applicable.