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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS-5879

Issued 1991-01-01

Submitted for recognition as an American National Standard

SHEET, STRIP, AND FOIL, CORROSION AND HEAT RESISTANT ALLOY 62Ni - 21.5Cr - 9.0Mo - 3.7(Cb+Ta) Cold Rolled and Annealed

UNS N06625

1. SCOPE:

1.1 Form: This specification covers a corrosion and heat resistant nickel alloy in the form of sheet, strip, and foil 0.100 inch (2.54 mm) and under in nominal thickness.

1.2 Application: Primarily for the fabrication of high-quality bellows and other applications requiring high strength, resistance to corrosion, maximum low-cycle fatigue life, and excellent formability and weldability.

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-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 of Corrosion and Heat Resistant Steels and Alloys, Wrought Products Except Forgings and Forging Stock

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

2.3.1 Military Standards:

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

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E 354, by spectrochemical methods, or by other analytical methods acceptable to purchaser:

	min	max
Carbon	--	0.03
Manganese	--	0.50
Silicon	--	0.15
Phosphorus	--	0.015
Sulfur	--	0.015
Chromium	20.00	23.00
Molybdenum	8.00	10.00
Columbium + Tantalum	3.15	4.15
Cobalt	--	1.00
Titanium (3.1.1)	--	0.40
Aluminum (3.1.1)	--	0.40
Iron	--	5.00
Nitrogen	--	0.02
Nickel	remainder	

3.1.1 Shall be present but not in excess of specified maximum.

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

3.2 Condition: Cold rolled, annealed, and, unless annealing is performed in an atmosphere yielding a bright finish, descaled having a surface appearance comparable to 3.2.1 or 3.2.2 as applicable (See 8.1). Overall grinding of the final product is not permitted.

3.2.1 Sheet: No. 2D finish.

3.2.2 Strip: No. 1 strip finish.

3.3 Heat Treatment: The product shall be annealed by heating to a temperature not lower than 1600°F (871°C), holding at the selected temperature within ±25°F (±14°C) for a time commensurate with section thickness, and cooling at a rate equivalent to an air cool or faster.

3.4 Properties: Product, 0.100 inch (2.54 mm) and under in nominal thickness, shall conform to the following requirements:

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

Tensile Strength, minimum	120,000 psi (827 MPa)
Yield Strength at 0.2% Offset, minimum	60,000 psi (414 MPa)
Elongation in 2 Inches (50.8 mm), minimum	40%

3.4.1.1 Yield strength requirements for product under 0.010 inch (0.25 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.4.1.2 Elongation requirements for product under 0.005 inch (0.13 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.4.2 Bending: The product 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 times the nominal thickness of the product with the axis of the bend parallel to the direction of rolling.

Nominal Thickness		Bend Factor
Inch	Millimetres	
Up to 0.050, incl	Up to 1.27, incl	1
Over 0.050 to 0.100, incl	Over 1.27 to 2.54, incl	2

3.4.3 Grain Size: Shall be not larger than the following, determined in accordance with ASTM E 112:

Nominal Thickness		ASTM Grain Size No.
Inch	Millimetres	
Up to 0.010, incl	Up to 0.25, incl	8
Over 0.010 to 0.050, incl	Over 0.25 to 1.27, incl	6
Over 0.050 to 0.100, incl	Over 1.27 to 2.54, incl	5

3.5 Quality:

3.5.1 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.

3.5.2 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.

3.6 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.

4.3 Sampling and Testing: Shall be in accordance with AMS-2371.

4.4 Reports: The vendor of the product shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for tensile properties, bending properties, and grain size requirements of each lot. This report shall include the purchase order number, lot number, AMS-5879, size, and quantity.

4.5 Resampling and Retesting: Shall be in accordance with AMS-2371.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each sheet, strip, and foil shall be legibly marked on one face, in the respective location indicated below, with AMS-5879, lot number, manufacturer's identification, and nominal thickness. The characters shall be applied using a suitable marking fluid be removable in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the product or its performance and shall be sufficiently stable to withstand normal handling.

5.1.1 Flat Strip 6 Inches (152 mm) and Under in Width: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 feet (914 mm).

5.1.2 Flat Sheet and Flat Strip Over 6 Inches (152 mm) in Width: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 feet (914 mm), the rows being spaced not more than 6 inches (152 mm) apart and alternately staggered.

5.1.3 Coiled Sheet, Strip, and Foil: Shall be marked near both the outside and inside ends of the coil; the markings shall be applied as in 5.1 or shall appear on a durable tag or label attached to the coil and marked with the information of 5.1. When the product is wound on cores, the tag or label may be attached to the core.