Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AEROSPACE MATERIAL SPECIFICATION

AMS 5550B
Superseding AMS 5550A
Issued 6-30-60
Revised 6-1-74

ALLOY SHEET AND STRIP, CORROSION AND HEAT RESISTANT
Nickel Base - 15.5Cr - 0.62Ti - 3.25Al

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1. SCOPE:

1.1 Form: This specification covers a precipitation-hardenable corrosion and heat resistant nickel-base alloy in the form of sheet and strip.

1.2 Application: Primarily for parts and assemblies requiring oxidation resistance up to approximately 2000°F (1093°C) and where parts may require welding during fabrication.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., Two Pennsylvania Plaza, New York, New York 10001.

2.1.1 Aerospace Material Specifications:

AMS 2262 - Tolerances, Nickel, Nickel-Base, and Cobalt-Base Alloy Sheet, Strip, and Plate
AMS 2269 - Chemical Check Analysis Limits, Wrought Nickel and Nickel-Base Alloys
AMS 2350 - Standards and Test Methods
AMS 2371 - Quality Assurance Sampling of Corrosion and Heat Resistant Alloys, Wrought Products Except Forgings

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

ASTM E8 - Tension Testing of Metallic Materials
ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E112 - Estimating the Average Grain Size of Metals
ASTM E290 - Semi-Guided Bend Test for Ductility of Metallic Materials
ASTM E354 - Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt-Base Alloys

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

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3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E354, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

	min	max
Carbon	--	0.10
Manganese	--	1.00
Silicon	--	0.70
Sulfur	--	0.01
Chromium	14.00	17.00
Titanium	0.25	1.00
Aluminum	2.75	3.75
Iron	--	2.00
Cobalt (3.1.1)	--	1.00
Copper	--	0.50
Nickel + Cobalt	remainder	

3.1.1 Determination not required for routine acceptance.

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

3.2 Condition: Cold rolled, annealed, and descaled unless annealing is performed in an atmosphere yielding a bright finish, having a surface appearance as close as possible to a commercial corrosion resistant steel No. 2D finish; standards for acceptance shall be as agreed upon by purchaser and vendor.

3.3 Properties:

3.3.1 As Annealed: The product shall conform to the following requirements:

3.3.1.1 Hardness: Shall be as follows, determined in accordance with ASTM E18:

3.3.1.1.1 Sheet 0.005 - 0.250 in. (0.13 - 6.35 mm), incl, and strip 0.005 - 0.025 in. (0.13 - 0.64 mm), excl, in nominal thickness shall have hardness not higher than 98 HRB or equivalent.

3.3.1.1.2 Strip 0.025 in. (0.64 mm) and over in nominal thickness shall have hardness as agreed upon by purchaser and vendor.

3.3.1.2 Bending: The product shall withstand, without cracking, bending in accordance with ASTM E290 through an angle of 180 deg (3.14 rad) around a diameter equal to the bend factor times the nominal thickness of the product with axis of bend parallel to the direction of rolling.

Nominal Thickness		Bend
Inch	(Millimetres)	Factor
Up to 0.050, incl	(Up to 1.27, incl)	1
Over 0.050 to 0.250, incl	(Over 1.27 to 6.35, incl)	2

3.3.1.3 Grain Size: Product 0.010 in. (0.25 mm) and over in nominal thickness shall have average grain size not over 0.0060 in. (0.152 mm) in diameter (ASTM Grain Size No. 2.5), determined in accordance with ASTM E112.

3.3.2 Properties After Precipitation Heat Treatment: The product shall conform to the following requirements after being precipitation heat treated by heating to 1400° F ± 25 (760° C ± 14), holding at heat for not less than 5 hr, and cooling in air.

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3.3.2.1 Tensile Properties: Shall be as shown in Table I, determined in accordance with ASTM E8:

TABLE I

Product	Nominal Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation in 2 in. or 4D %, min
Strip	Up to 0.010, excl	125,000	--	--
	0.010 to 0.125, incl	125,000	--	15
Sheet	0.010 to 0.025, excl	125,000	60,000	17
	0.025 to 0.250, incl	125,000	60,000	25

TABLE I (SI)

Product	Nominal Thickness Millimetres	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa, min	Elongation in 50.8 mm or 4D %, min
Strip	Up to 0.25 excl	862	--	--
	0.25 to 3.18 incl	862	--	15
Sheet	0.25 to 0.64 excl	862	414	17
	0.64 to 6.35 incl	862	414	25

3.3.2.2 Hardness: Should be not lower than 21 HRC or equivalent, determined in accordance with ASTM E18, but the product shall not be rejected on the basis of hardness if the tensile property requirements are met.

3.4 Quality: The product shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of AMS 2262.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that the product conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance or routine control tests.

4.3 Sampling: Shall be in accordance with AMS 2371 and the following:

4.3.1 Tensile test specimens from widths 9 in. (229 mm) and over shall be taken with the axis perpendicular to the direction of rolling; for widths less than 9 in. (229 mm), tensile test specimens shall be taken with the axis parallel to the direction of rolling.

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