Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 5552B
Superseding 5552A

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UNS N08801

ALLOY SHEET, STRIP, AND PLATE, CORROSION AND HEAT RESISTANT
46Fe - 32Ni - 20.5Cr - 1.1Ti

1. SCOPE:

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

1.2 Application: Primarily for low-stressed parts and assemblies requiring corrosion and oxidation resistance at temperatures up to 1800°F (982°C), particularly where such 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., 400 Commonwealth Drive, Warrendale, PA 15096

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, PA 19103

ASTM E8 - Tension Testing 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, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard Nl. 151 - Metals; Test Methods

2.3.2 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 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	--	1.50
Silicon	--	1.00
Sulfur	--	0.015
Chromium	19.0	22.0
Nickel	30.0	34.0
Titanium	0.75	1.5
Cobalt (3.1.1)	--	1.0
Copper	--	0.5
Iron	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: The product shall be supplied in the following condition:

3.2.1 Sheet and Strip: 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.

3.2.2 Plate: Hot rolled and annealed; plate shall be descaled, when so ordered.

3.3 Properties: The product shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as follows, determined in accordance with ASTM E8:

Tensile Strength	80,000 - 105,000 psi (552-724 MPa)
Yield Strength at 0.2% Offset, min	30,000 psi (207 MPa)
Elongation in 2 in. (50.8 mm) or 4D, min	30%

3.3.1.1 Elongation requirements do not apply to product under 0.020 in. (0.51 mm) in nominal thickness.

3.3.2 Bending: Product 0.750 in. (19.05 mm) and under in nominal thickness shall withstand, without cracking, bending in accordance with ASTM E290 at room temperature through an angle of 180 deg (3.14 rad) around a diameter equal to the bend factor shown below times the nominal thickness of the product with axis of bend parallel to the direction of rolling.

Form	Nominal Thickness Inch	Nominal Thickness (Millimetres)	Bend Factor
Sheet	0.010 to 0.250, incl	(0.25 to 6.35, incl)	1
Strip	Up to 0.125, incl	(Up to 3.18, incl)	1
Plate	0.187 to 0.750, incl	(4.75 to 19.05, incl)	2

3.3.2.1 Bending requirements for plate over 0.750 in. (19.05 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3.3 Grain Size: Shall be not larger than the following determined in accordance with ASTM E112:

Form	Nominal Thickness Inch	Nominal Thickness (Millimetres)	ASTM Grain Size
Sheet	Up to 0.050, incl	(Up to 1.27, incl)	4
	Over 0.050	(Over 1.27)	3
Strip	0.005 to 0.010, incl	(0.13 to 0.25, incl)	8
	Over 0.010	(Over 0.25)	4

3.3.3.1 Grain size of plate shall be as agreed upon by purchaser and vendor.

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 ensure 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 of the specimen perpendicular to the direction of rolling; for widths less than 9 in. (229 mm), specimens shall be taken with axis parallel to the direction of rolling.

4.4 Reports:

4.4.1 The vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each heat in the shipment and the results of tests on each thickness from each heat to determine conformance to the tensile property, bending, and grain size requirements of this specification. This report shall include the purchase order number, heat number, material specification number and its revision letter, size, and quantity from each heat.