

**AEROSPACE
MATERIAL
SPECIFICATION**

AMS 5552C

Superseding AMS 5552B

Issued 6-30-60
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ALLOY SHEET, STRIP, AND PLATE, CORROSION AND HEAT RESISTANT

46Fe - 20.5Cr - 32Ni - 1.1Ti

UNS N08801

Annealed

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 up to 1800°F (980°C), but useful at the higher temperatures only when stresses are low, and 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 SAE, 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 Alloys and Cobalt Alloys

AMS 2350 - Standards and Test Methods

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 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 Alloys

- 2.3 U.S. 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 No. 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 analytical methods approved by purchaser:

	min	max
Carbon	--	0.10
Manganese	--	1.50
Silicon	--	1.00
Sulfur	--	0.015
Chromium	19.0	22.0
Nickel + Cobalt	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, unless annealing is performed
 Ø in an atmosphere yielding a bright finish, descaled and having a surface appearance comparable 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
 Ø ASTM E8 on product 0.010 in. (0.25 mm) to 2.000 in. (50.00 mm) in nominal thickness:

Tensile Strength	80,000 - 105,000 psi (550 - 725 MPa)
Yield Strength at 0.2% Offset, min	30,000 psi (205 MPa)
Elongation in 2 in. (50 mm) or 4D, min	30%

3.3.1.1 Tensile property requirements for product under 0.010 in. (0.25 mm) or
 Ø over 2.000 in. (50.00 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3.2 Bending: Product 0.010 - 0.250 in. (0.25 - 6.25 mm), incl, in nominal
 Ø thickness shall withstand, without cracking, bending in accordance with ASTM E290 through an angle of 180 deg 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.

Form	Nominal Thickness		Bend Factor
	Inches	(Millimetres)	
Sheet and Strip	0.010 to 0.50, incl	(0.25 to 1.25, incl)	1
Sheet	Over 0.050 to 0.250, incl	(Over 1.25 to 6.25, incl)	2
Sheet	Over 0.050 to 0.125, incl	(Over 1.25 to 3.12, incl)	2

3.3.2.1 Bending requirements for product under 0.010 in. (0.25 mm) or over
 Ø 0.250 in. (6.25 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

AMS 5552C

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

Form	Nominal Thickness		ASTM Grain Size No.
	Inches	(Millimetres)	
Sheet	0.010 to 0.050, incl	(0.25 to 1.25, incl)	4
	Over 0.050 to 0.250, incl	(Over 1.25 to 6.25, incl)	3
Strip	0.010 to 0.125, incl	(0.25 to 3.12, incl)	4

- 3.3.3.1 Grain size requirements for sheet and strip under 0.010 in. (0.25 mm), for strip over 0.125 in. (3.12 mm), and for plate shall be as agreed upon by purchaser and vendor.

- 3.4 Quality: The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to usage of the product.

- 3.6 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 for vendor's tests 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 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 to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.

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

4.4 Reports:

- 4.4.1 The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests for chemical composition of each heat and the results of tests on each lot to determine conformance to the other technical requirements of this specification. This report shall include the purchase order number, heat number, AMS 5552C, size, and quantity from each heat.