

AEROSPACE MATERIAL SPECIFICATION



AMS 5552E

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Superseding AMS 5552D

Alloy, Corrosion and Heat Resistant, Sheet, Strip, and Plate
46Fe - 20.5Cr - 32Ni - 1.1Ti
Annealed

UNS N08801

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:

These products have been used typically for low-stressed parts requiring corrosion and oxidation resistance up to 1800 °F (982 °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.

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

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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 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	--	0.10
Manganese	--	1.50
Silicon	--	1.00
Sulfur	--	0.015
Chromium	19.00	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, unless annealing is performed in an atmosphere yielding a bright finish, descaled having a surface finish 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 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 shown in Table 2, determined in accordance with ASTM E 8 or ASTM E 8M on product 0.010 to 2.000 inches (0.25 to 50.80 mm) in nominal thickness.

TABLE 2 - Tensile Properties

Property	Value
Tensile Strength	80.0 to 105 ksi (552 to 724 MPa)
Yield Strength at 0.2% Offset, min	30.0 ksi (207 MPa)
Elongation in 2 Inches (50.8 mm) or 4D, min	30%

3.3.2 Bending: Sheet and strip 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 0.1874, incl	Over 1.27 to 4.760, incl	2

- 3.3.3 Average Grain Size: Shall be not larger than shown in Table 4, determined in accordance with ASTM E 112.

TABLE 4 - Maximum Grain Size

Form	Nominal Thickness Inch	Nominal Thickness Millimeters	ASTM Grain Size No.
Sheet	0.010 to 0.050, incl	0.25 to 1.27, incl	4
Sheet Over	0.050 to 0.1874, incl	Over 1.27 to 4.760, incl	3
Strip	0.010 to 0.125, incl	0.25 to 3.18, incl	4

- 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:

All technical requirements are acceptable 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 the results of tests on each lot to determine conformance to the other technical requirements. This report shall include the purchase order number, heat and lot number, AMS 5552E, size, and quantity.