

# AEROSPACE MATERIAL SPECIFICATION

Issued JUN 1960  
Reaffirmed SEP 2000  
Revised MAR 2006  
Superseding AMS 5552E

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

(Composition similar to UNS N08801)

## RATIONALE

AMS 5552F is a Five Year Review and update of this specification.

### 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 issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

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## 2.1 SAE Publications:

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS 2262	Tolerances, 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
AS4194	Sheet and Strip Surface Finish Nomenclature

## 2.2 ASTM Publications:

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A 480/A 480M	Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip
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

## 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 applicable 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 appearance in accordance with ASTM A480/A 480M and AS4194 comparable to 3.2.1.1 or 3.2.1.2 as applicable.

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 3.5 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 the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

- 4.2 Classification of Tests:

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 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 5552F, size, and quantity.

- 4.5 Resampling and Retesting:

Shall be in accordance with AMS 2371.