

AEROSPACE MATERIAL SPECIFICATION

SAE AMS5506

REV. F

Issued 1952-11
Revised 2001-11
Reaffirmed 2012-04

Superseding AMS5506E

Steel, Corrosion and Heat Resistant, Sheet, Strip, and Plate
13Cr (0.30 - 0.40C) (SAE 51420)
Annealed

(Composition similar to UNS S42000)

RATIONALE

AMS5506F has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Form:

This specification covers a corrosion and moderate heat resistant steel in the form of sheet, strip, and plate.

1.2 Application:

These products have been used typically for parts, such as snap rings and flat springs, requiring corrosion and oxidation resistance up to 800 °F (427 °C), 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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

AMS 2242	Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate
MAM 2242	Tolerances, Metric, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate
AMS 2248	Chemical Check Analysis Limits, Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2371	Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock

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on this Technical Report, please visit
<http://www.sae.org/technical/standards/AMS5506F>

2.1 (Continued):

- 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, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or www.astm.org.

- ASTM A 370 Mechanical Testing of Steel Products
- 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
- ASTM E 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron 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 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	0.30	0.40
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	12.00	14.00
Nickel	--	0.50
Molybdenum	--	0.50
Aluminum	--	0.15
Copper	--	0.50
Tin	--	0.05

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2248.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Sheet: Hot or cold rolled, annealed, and, unless annealing is performed in an atmosphere yielding a bright finish, descaled having a surface appearance in accordance with ASTM A 480/A 480M and AS4194 comparable to 3.2.1.1 or 3.2.1.2 as applicable.

3.2.1.1 Hot Rolled: No. 1 finish.

3.2.1.2 Cold Rolled: No. 2D finish.

3.2.2 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 A 480/A 480M and AS4194 comparable to a No. 1 strip finish.

3.2.3 Plate: Hot or cold rolled, annealed, and descaled.

3.3 Properties:

The product shall conform to the following requirements; tensile, hardness, and bend testing shall be performed in accordance with ASTM A 370:

3.3.1 Tensile Properties: Shall be as shown in Table 2, determined in accordance with ASTM E 8 or ASTM E 8M.

TABLE 2 - Tensile Properties

Property	Value
Tensile Strength, maximum	100 ksi (689 MPa)
Elongation in 2 inches (50.8 mm) or 4D, minimum	
Nominal Thickness	
Up to 0.030 inch (0.76 mm), excl	12%
0.030 inch (0.76 mm) and over	15%

3.3.2 Bending: Product 0.500 inch (12.70 mm) and under in nominal thickness shall withstand, without cracking, bending through the angle shown in Table 3 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.

TABLE 3 - Bending Parameters

Nominal Thickness Inch	Nominal Thickness Millimeters	Type of Bend	Angle Degrees, min	Bend Factor
Up to 0.375, incl	Up to 9.52, incl	Free Bend	180	2
Over 0.375 to 0.500, incl	Over 9.52 to 12.70, incl	Free Bend	180	3

- 3.3.3 Response to Heat Treatment: Product 0.500 inch (12.70 mm) and under in nominal thickness and specimens 0.500 inch $\pm$ 0.010 (12.70 mm $\pm$ 0.25) thick cut from heavier product shall have hardness not lower than 50 HRC, or equivalent (See 8.2), after being heated to 1825 °F $\pm$ 10 (996°C $\pm$ 6), held at heat for 25 minutes $\pm$ 2, and cooled at a rate equivalent to cooling in air.

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 2242 or MAM 2242.

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:

- 4.2.1 Acceptance Tests: Composition (3.1), tensile properties (3.3.1), response to heat treatment (3.3.3), and tolerances (3.5) are acceptance tests and shall be performed on each heat or lot as applicable.

- 4.2.2 Periodic Tests: Bending (3.3.2) is a periodic test and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

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 for tensile properties and response to heat treatment for each lot, and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS 5506F, size, and quantity.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2371.