SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5510R

Issued DEC 1939
Revised OCT 2003

Superseding AMS 5510P

Steel, Corrosion and Heat-Resistant, Sheet, Strip and Plate
18Cr - 10.5Ni - 0.40Ti (SAE 30321)
Solution Heat Treated

(Composition similar to UNS S32100)

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1. SCOPE:

1.1 Form:

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

1.2 Application:

These products have been used typically for parts requiring both corrosion and heat resistance, especially when such parts require welding during fabrication and for parts requiring oxidation resistance up to 1500 °F (816 °C) but useful at that temperature only when stresses are low, 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 supplied 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.

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
AMS 2248	Chemical Check Analysis Limits, Corrosion and Heat-Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys

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2.1 (Continued):

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

ASTM A 262	Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels
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 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	-	0.08
Manganese	-	2.00
Silicon	0.25	1.00
Phosphorus	-	0.040
Sulfur	-	0.030
Chromium	17.00	19.00
Nickel	9.00	12.00
Titanium	5x(C+N)	0.70
Molybdenum	-	0.75
Copper	-	0.75
Nitrogen	-	0.10

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

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3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Sheet and Strip: Cold rolled, solution heat treated, and, unless solution heat treatment is performed in an atmosphere yielding a bright finish, descaled having a surface appearance in accordance with ASTM A 480/A 480M and AS4194 conforming to 3.2.1.1 or 3.2.1.2, as applicable.

3.2.1.1 Sheet: No. 2D finish, except No. 2B finish may be supplied if acceptable to purchaser.

3.2.1.2 Strip: No. 1 strip finish.

3.2.2 Plate: Hot or cold rolled, solution heat treated, and descaled.

3.3 Properties:

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

3.3.1 Tensile Properties: Shall be as shown in Table 2:

TABLE 2A - Tensile Properties, Inch/Pound Units

Nominal Thickness Inch	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi, min	Elongation in 2 inches or 4D %, min
Over 0.002 to 0.003, incl	70 - 110	25 ksi	20
Over 0.003 to 0.004, incl	70 - 105	25 ksi	30
Over 0.004	70 - 100	25 ksi	40

TABLE 2B - Tensile Properties, SI Units

Nominal Thickness Millimeter	Tensile Strength MPa	Yield Strength at 0.2% Offset MPa, min	Elongation in 50.8 mm or 4D %, min
Over 0.05 to 0.08, incl	483 - 758	172	20
Over 0.08 to 0.10, incl	483 - 724	172	30
Over 0.10	483 - 689	172	40

3.3.2 Bending: Product 0.749 inch (19.02 mm) and under in nominal thickness shall withstand, without cracking, bending through the angle indicated 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.

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TABLE 3 - Bending Parameters

Nominal Thickness Inch	Nominal Thickness Millimeters	Angle deg, min	Bend Factor
Up to 0.249, incl	Up to 6.32, incl	180	1
Over 0.249 to 0.749, incl	Over 6.32 to 19.02, incl	90	1

3.3.3 Susceptibility to Intergranular Attack: The product, after sensitizing treatment, shall pass the intergranular corrosion test performed in accordance with ASTM A 262, Practice E.

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.

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), bending of product 0.1874 inch (4.762 mm) and under in nominal thickness (3.3.2), and tolerances (3.5) are acceptance tests and shall be performed on each heat or lot as applicable.

4.2.2 Periodic Tests: Bending of product over 0.1874 inch (4.762 mm) in nominal thickness (3.3.2) and susceptibility of intergranular attack (3.3.3) are periodic tests 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.

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