

UNS S30908

STEEL SHEET, STRIP, AND PLATE, CORROSION AND HEAT RESISTANT  
23Cr - 13.5Ni (309S)  
Solution Heat Treated

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: Primarily for parts and assemblies requiring both corrosion and heat resistance and oxidation resistance up to 2000°F (1095°C). Strength at elevated temperatures is similar to that of the 18-8 types.

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 2242 - Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate

AMS 2248 - Chemical Check Analysis Limits, Wrought Corrosion and Heat Resistant Steels and Alloys, Maraging, and Other Highly-Alloyed Steels, and Iron 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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# AMS 5523C

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM A370 - Mechanical Testing of Steel Products

ASTM E353 - Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron 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 Specifications:

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 E353, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

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	min	max
Carbon	--	0.08
Manganese	--	2.00
Silicon	--	1.00
Phosphorous	--	0.040
Sulfur	--	0.030
Chromium	22.00 - 24.00	
Nickel	12.00 - 15.00	
Molybdenum		0.75
Copper		0.75

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

3.2 Condition: The product shall be supplied in the following condition;  
Ø standards for acceptance of surface appearance shall be as agreed upon by purchaser and vendor:

3.2.1 Sheet and Strip: Cold rolled, solution heat treated free from continuous carbide network, and, unless solution heat treatment is performed in an atmosphere yielding a bright finish, descaled having a surface appearance comparable to the following commercial corrosion-resistant steel finishes:

3.2.1.1 Sheet: No. 2D Finish.

3.2.1.2 Strip: No. 1 Strip Finish.

3.2.2 Plate: Hot rolled, solution heat treated free from continuous carbide network, and descaled.

3.3 Properties: The product shall conform to the following requirements, tensile and bend testing shall be performed in accordance with ASTM A370:

3.3.1 Tensile Properties: Shall be as follows:

Tensile Strength, max	100,000 psi (690 MPa)
Elongation in 2 in. (50 mm) or 4D, min	40%

3.3.2 Bending: Product 0.749 in. (18.75 mm) and under in nominal thickness shall withstand, without cracking, bending through the angle indicated below around a diameter equal to the nominal thickness of the product with axis of bend parallel to the direction of rolling.

Nominal Thickness		Angle deg, min
Inch	Millimetres	
Up to 0.249, incl	(Up to 6.25, incl)	180
Over 0.249 to 0.749, incl	(Over 6.25 to 18.75, incl)	90

3.3.2.1 Bending requirements for product over 0.749 in. (18.75 mm) in nominal thickness 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.

3.5 Tolerances: Unless otherwise specified, 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 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.

# AMS 5523C

- 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 for tensile and bending properties of each lot. This report shall include the purchase order number, heat number, AMS 5523C, size, and quantity from each heat.
- 4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, AMS 5523C, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification and shall include in the report either a statement that the material conforms or copies of laboratory reports showing the results of tests to determine conformance.
- 4.5 Resampling and Retesting: Shall be in accordance with AMS 2371.
5. PREPARATION FOR DELIVERY:
- 5.1 Identification: Each sheet, strip, and plate shall be marked on one face, in the respective location indicated below, with AMS 5523C, heat number, manufacturer's identification, and nominal thickness. The characters shall be of such size as to be legible, shall be applied using a suitable marking fluid, and shall be removable in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the product or its performance and shall be sufficiently stable to withstand normal handling.
- 5.1.1 Flat Strip 6 In. (150 mm) and Under in Width: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 ft (900 mm).
- 5.1.2 Flat Sheet, Flat Strip Over 6 In. (150 mm) in Width and Plate: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 ft (900 mm), the rows being spaced not more than 6 in. (150 mm) apart and alternately staggered.