

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 5538

Issued 12-1-53

Revised

STEEL SHEET AND STRIP, CORROSION AND HEAT RESISTANT 20Cr - 9Ni - 1.6Mo - 1.4W - Ti

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. FORM: Sheet, strip, and plate.
3. APPLICATION: Primarily for parts and welded assemblies, such as turbine nozzles, tail pipes, and exhaust cones, requiring high strength up to 1150 F and oxidation resistance up to 1600 F.
4. COMPOSITION:

		Check Analysis	
		Under Min	or Over Max
Carbon	0.28 - 0.35	0.02	0.02
Manganese	0.75 - 1.50	0.04	0.04
Silicon	0.30 - 0.80	0.05	0.05
Phosphorous	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	18.00 - 21.00	0.25	0.25
Nickel	8.00 - 11.00	0.15	0.15
Molybdenum	1.25 - 2.00	0.05	0.05
Tungsten	1.00 - 1.75	0.05	0.05
Titanium	0.40 - 0.75	0.05	0.05
Copper	0.50 max	--	0.03

5. CONDITION:
 - 5.1 Sheet: Hot rolled, annealed and descaled having a surface appearance as close as possible to a commercial corrosion resistant steel No. 2D finish; actual acceptance and rejection standards shall be as agreed upon by purchaser and vendor.
 - 5.2 Strip: Cold rolled, annealed and descaled (No 1 Strip Finish).
 - 5.3 Plate: Hot rolled, annealed and descaled.
6. TECHNICAL REQUIREMENTS:
 - 6.1 Heat Treatment: Unless otherwise specified, material shall be annealed by heating to 1800 F \pm 25, followed by air cooling.

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6.2 Tensile Properties:

Tensile Strength, psi	95,000 - 120,000
Yield Strength at 0.2% offset or at 0.0071 in. in 2 in. Extension Under Load (E=29,000,000), psi	45,000 min
Elongation, % in 2 in.	30 min

6.2.1 For widths 9 in. and over, tensile test specimens shall be taken with the axis perpendicular to the direction of rolling. For widths less than 9 in., tensile test specimens shall be taken with the axis parallel to the direction of rolling.

6.3 Bending: Material shall withstand, without cracking, bending at room temperature through the angle indicated below around a diameter equal to the bend factor times the nominal thickness of the material, with axes of bends both perpendicular and parallel to the direction of rolling.

Nominal Thickness Inch	Angle degrees, min	Bend Factor
Under 0.050	180	1
0.050 and over	90	2

7. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2242 as applicable. Thickness and flatness tolerances shall be as specified below:

8.1 Thickness: Tables I and III.

8.2 Flatness: 7.1 and 7.4

9. REPORTS:

9.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each heat in the shipment, and the results of tests on each thickness from each heat to determine conformance to the tensile and bending requirements of this specification. This report shall include the purchase order number, material specification number, thickness, size, and quantity from each heat.

9.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, 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 a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.