Society of Automotive Engineers, Inc.
485 LEXINGTON AVENUE, NEW YORK, N.Y. 10017

AEROSPACE MATERIAL SPECIFICATION

AMS 5603

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Revised

STEEL SHEET AND STRIP, CORROSION AND MODERATE HEAT RESISTANT
15Cr - 8.4Ni - 2.2Mo - 1.1Al
Vacuum Induction Melted, Solution Heat Treated

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for parts requiring corrosion resistance, high strength, high fracture toughness, and oxidation resistance up to 800 F (427 C), and where such parts may require welding or brazing during fabrication.

3. COMPOSITION:

	min	max
Carbon	--	0.05
Manganese	--	0.10
Silicon	--	0.10
Phosphorus	--	0.010
Sulfur	--	0.008
Chromium	14.75	15.50
Nickel	8.00	8.75
Molybdenum	2.00	2.50
Aluminum	0.90	1.35
Nitrogen	--	0.01

3.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248.

4. CONDITION:

4.1 Sheet: Cold rolled, solution heat treated, and descaled (No. 2D Finish).

4.2 Strip: Cold rolled, solution heat treated, and descaled (No. 1 Strip Finish).

5. TECHNICAL REQUIREMENTS:

5.1 Heat Treatment: Unless otherwise specified, material shall be solution heat treated by heating to 1825 F ± 25 (995.6 C ± 14), holding at heat for not less than 3 min. per 0.1 in. of thickness, and air cooling to room temperature.

5.2 Tensile Properties:

5.2.1 Material 0.005 In. and Over in Thickness:

Tensile Strength, psi	150,000 max
Yield Strength at 0.2% Offset or at 0.0085 in. in 2 in. Extension Under Load (E = 29,000,000) psi	65,000 max
Elongation, % in 2 in.	20 min

5.2.2 Material Under 0.005 In. in Thickness: Shall be as agreed upon by purchaser and vendor.

5.2.3 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.

5.3 Hardness:

5.3.1 Material Over 0.010 In. in Thickness: Shall be not higher than Rockwell B 100 or equivalent.

5.3.2 Material 0.010 In. Under in Thickness: Shall be as agreed upon by purchaser and vendor.

5.4 Bending: Material shall withstand, without cracking, bending at room temperature through the angle indicated below around a diameter equal to the nominal thickness of the material, with axle of bend parallel to the direction of rolling.

Type of Bend	Angle deg, min
Free Bend	180
V-Block	135

5.5 Properties After Austenite Conditioning, Subzero Transformation, and Precipitation Hardening: Material shall conform to the following requirements after heating to 1700 F ± 15 (926.7 C ± 8.3), holding at heat for 1 hr, rapidly cooling to 75 F (23.9 C), and within 1 hr starting cooling to -100 F ± 10 (-73.3 C ± 5.6), holding at this temperature for not less than 8 hr, warming in air to room temperature, heating to 950 F ± 10 (510 C ± 5.6), holding at heat for 1 hr, and cooling in air.

5.5.1 Tensile Properties: The following requirements apply to material having nominal thickness of 0.005 in. and over:

Tensile Strength, psi	220,000 min
Yield Strength at 0.2% Offset or at 0.0171 in. in 2 in. Extension Under Load (E = 29,000,000), psi	190,000 min
Elongation, % in 2 in.	
Nominal Thickness, Inch	
0.005 to 0.010, excl	2 min
0.010 to 0.020, excl	3 min
0.020 and over	4 min

5.5.1.1 Tensile properties of material under 0.005 in. thick shall be as agreed upon by purchaser and vendor.

5.5.2 Hardness:

5.5.2.1 Material Over 0.010 In. in Thickness: Shall be not lower than Rockwell C 45 or equivalent.

5.5.2.2 Material 0.010 In. and Under in Thickness: Shall be as agreed upon by purchaser and vendor.

5.5.3 Fracture Toughness: Fracture toughness test, when specified, shall be conducted as agreed upon by purchaser and vendor.

6. QUALITY: Material shall be vacuum induction melted. The product shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2242.