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

AEROSPACE MATERIAL SPECIFICATION

AMS 5604

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Revised

STEEL, SHEET, STRIP, AND PLATE, CORROSION RESISTANT
16.5Cr - 4.0Ni - 4.0Cu

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 and high strength at service temperatures up to 600 F (316 C), and where such parts may require welding during fabrication.

3. COMPOSITION:

	min	max
Carbon	--	0.07
Manganese	--	1.00
Silicon	--	1.00
Phosphorous	--	0.040
Sulfur	--	0.030
Chromium	15.50	17.50
Nickel	3.00	5.00
Columbium + Tantalum	0.15	0.45
Copper	3.00	5.00

3.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248, except that check analysis limits for copper shall be 0.10 under min or over maximum.

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).

4.3 Plate: Hot rolled, solution heat treated, and descaled.

5. TECHNICAL REQUIREMENTS: When ASTM methods are specified for determining conformance to the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

5.1 Heat Treatment:

5.1.1 Sheet and Strip: Unless otherwise specified, material shall be solution heat treated by heating to 1900 F ± 25 (1037.8 C ± 14), holding at heat for not less than 3 min. per 0.1 in. of thickness, and air cooling to room temperature.

5.1.2 Plate: Unless otherwise specified, material shall be solution heat treated by heating to 1950 F ± 25 (1065.6 C ± 14), holding at heat for not less than 30 min. for each inch of thickness plus 1 hr, and air cooling to room temperature.

5.2 Tensile Properties:

5.2.1 Sheet and Strip: The following requirements apply to material having nominal thickness of 0.015 to 0.1875 in., exclusive:

Tensile Strength, psi	185,000 max
Yield Strength at 0.2% Offset or at 0.0152 in. in 2 in. Extension Under Load (E = 28,500,000), psi	160,000 max
Elongation, % in 2 in.	3 min

5.2.1.1 Tensile properties of material under 0.015 in. in thickness shall be as agreed upon by purchaser and vendor.

5.2.1.2 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.

5.2.1.3 When a dispute occurs between purchaser and vendor over the yield strength values, yield strength determined by the offset method shall apply.

5.2.2 Plate: Tensile properties are not required; only hardness is required.

5.3 Bending: Material 0.109 in. and under in thickness shall withstand without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to 9 times the nominal thickness of the material with axis of bend parallel to the direction of rolling.

5.4 Hardness: Material shall have hardness not higher than Rockwell C 38 or equivalent, determined in accordance with ASTM E18.

5.5 Properties After Precipitation Heat Treatment: Material shall conform to the following requirements after heating to 900 F ± 10 (482.2 C ± 5.6), holding at heat for 1 hr, and air cooling to 75 F (24 C) or lower.

5.5.1 Tensile Properties: The following requirements apply to material 0.015 - 4.000 in., incl, in thickness:

Tensile Strength, psi	190,000 min
Yield Strength at 0.2% offset or at 0.0159 in. in 2 in. Extension Under Load (E = 28,500,000), psi	170,000 min
Elongation, % in 2 in. or 4D	
Nominal Thickness, Inches	
0.015 to 0.1875, excl	5 min
0.1875 to 0.625, incl	8 min
Over 0.625 to 4.000, incl	10 min
Reduction of Area, (round specimens), %	
Nominal Thickness, Inches	
Up to 0.625, incl	30 min
Over 0.625 to 4.000, incl	35 min

5.5.1.1 If sizes other than those shown are ordered, tensile property requirements shall be as agreed upon by purchaser and vendor.

5.5.1.2 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.

5.5.1.3 When a dispute occurs between purchaser and vendor over the yield strength values, yield strength determined by the offset method shall apply.