

# AERONAUTICAL MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

## AMS 5549

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Revised

STEEL PLATE, CORROSION AND MODERATE HEAT RESISTANT  
15.5Cr - 4.5Ni - 2.9Mo - 0.1N

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily for parts and assemblies requiring high strength and oxidation resistance up to 800 F and where parts require welding during fabrication.

3. COMPOSITION:

		Check Analysis	
		Under Min	or Over Max
Carbon	0.10 - 0.15	0.01	0.01
Manganese	0.50 - 1.25	0.04	0.04
Silicon	0.50 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	15.00 - 16.00	0.20	0.20
Nickel	4.00 - 5.00	0.07	0.07
Molybdenum	2.50 - 3.25	0.10	0.10
Nitrogen	0.07 - 0.13	0.01	0.01

4. CONDITION: Hot rolled, annealed, and descaled.
5. TECHNICAL REQUIREMENTS:
  - 5.1 Heat Treatment: Unless otherwise specified, material shall be annealed by heating to 1900 - 1975 F, holding at heat for not less than 45 min. per inch of thickness, and quenching in water or otherwise cooling as rapidly as possible to room temperature.
  - 5.2 Hardness: Shall be not higher than Rockwell C 35 or equivalent.
  - 5.3 Bending: Material shall withstand, without cracking, bending at room temperature through the angle indicated below around a diameter equal to 3 times the nominal thickness, with axis of bend parallel to direction of rolling.

Nominal Thickness Inches	Angle deg, min
Over 0.187 to 0.249, incl	130
Over 0.249 to 0.750, incl	90

- 5.4 Properties After Austenite Conditioning, Sub-Zero Cooling, and Tempering:  
Material austenite conditioned by heating to  $1710\text{ F} \pm 25$ , holding at heat for not less than 45 min. per inch of thickness, and quenching in water or otherwise cooling as rapidly as possible to room temperature, cooled to not higher than  $-100\text{ F}$ , held at this temperature for not less than 3 hr, warmed in air to room temperature, and tempered by heating to  $850\text{ F} \pm 25$ , holding at heat for not less than 3 hr, and cooling in air shall be capable of meeting the following requirements:

5.4.1 Tensile Properties:

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated ( $E = 30,000,000$ )		Elongation % in 2 in. min
		psi, min	Extension Under Load in. in 2 in.	
0.375 and under	190,000	165,000	0.0150	10
Over 0.375 to 1.000, incl	190,000	150,000	0.0140	10
Over 1.000	190,000	As agreed upon by purchaser and vendor		10

- 5.4.1.1 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.

- 5.4.2 Hardness: Shall be Rockwell C 43 - 53 or equivalent.

6. QUALITY: Material 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 the latest issue of AMS 2242 as applicable.

8. REPORTS:

- 8.1 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 technical requirements of this specification. This report shall include the purchase order number, heat number, material specification number, thickness, size, and quantity from each heat.