

# AERONAUTICAL MATERIAL SPECIFICATIONS

## AMS 5547A

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

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

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
- Ø2. FORM: Sheet and strip. (For plate refer to AMS 5549.)
3. APPLICATION: Primarily for parts and assemblies requiring high strength and oxidation resistance up to 800 F and where parts require welding during fabrication.
4. 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

5. CONDITION:
  - 5.1 Sheet: Hot or cold rolled, annealed, and descaled (No. 2D Finish or equivalent).
  - 5.2 Strip: Cold rolled, annealed, and descaled (No. 1 Strip Finish).
6. TECHNICAL REQUIREMENTS:
  - 6.1 Heat Treatment: Unless otherwise specified, material shall be annealed by heating to 1850 - 1900 F, holding at heat for not less than 45 min. per inch of Ø thickness, and quenching in water or otherwise cooling as rapidly as possible to room temperature.
  - 6.2 Hardness: Shall be not higher than Rockwell C 35 or equivalent.
  - 6.3 Bending: Material shall withstand, without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to three times the nominal thickness with axis of bend parallel to direction of rolling.

Section 7C of the SAE Technical Board rules provides that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no obligation to conform to or be guided by any technical report, in formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

6.4 Properties After Austenite Conditioning, Sub-Zero Cooling, and Tempering:

Material austenite conditioned by heating to 1710 F + 25, holding at heat for not less than 45 min. per inch of thickness, quenching in water or otherwise cooling as rapidly as possible to room temperature, cooled to not higher than -100 F, held at this temperature for not less than 3 hr, warmed in air to room temperature, heated to 850 F + 25, held at heat for not less than 3 hr, and cooled in air shall be capable of meeting the following requirements:

6.4.1 Tensile Properties:

∅	Tensile Strength, psi	190,000 min
	Yield Strength at 0.2% Offset or at 0.0150 in. in 2 in. Extension Under Load (E = 30,000,000), psi	165,000 min
	Elongation, % in 2 in.	
	Nominal Thickness, inch	
	0.0005 to 0.0015, incl	2 min
	Over 0.0015 to 0.0020, incl	3 min
	Over 0.0020 to 0.0050, incl	5 min
	Over 0.0050 to 0.0100, incl	7 min
	Over 0.0100 to 0.1875, excl	8 min

6.4.1.1 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.

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

7. 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.

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

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 technical requirements of this specification. This report shall include the purchase order number, heat number, material specification number, thickness, size, quantity from each heat, and a statement of record of specific heat treating temperatures and cycles used to provide reported properties.

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.