

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5502^A

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STEEL SHEET AND STRIP, LOW HEAT RESISTANT 5Cr - 0.5Mo

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **FORM:** Sheet, strip, and plate.
3. **APPLICATION:** Primarily for parts and assemblies requiring good oxidation resistance and good physical properties up to 800 F. The material is weldable with great care and should be handled carefully during any thermal treatment to avoid cracking.

4. COMPOSITION:

		Check Analysis	
		Under Min	or Over Max
Carbon	0.10 - 0.20	0.00	0.00
Manganese	1.00 max	--	0.04
Silicon	1.00 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	4.00 - 6.00	0.10	0.10
Molybdenum	0.40 - 0.60	0.03	0.03

5. **CONDITION:** Unless otherwise specified, the material shall be furnished in the following condition:

- 5.1 **Sheet:** Hot rolled, annealed, descaled and oiled (No. 1 Finish).
- 5.2 **Strip:** Cold rolled, annealed, descaled and oiled (No. 1 Strip Finish).
- 5.3 **Plate:** Hot rolled, annealed, descaled and oiled.

6. TECHNICAL REQUIREMENTS:

6.1 Tensile Properties:

Tensile Strength, psi	75,000 max
Elongation, % in 2 in.	
Thickness up to 0.050 in.	20 min
0.050 to 0.1875 in., incl	25 min
Over 0.1875	30 min

- 6.1.1 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.

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 agreement to adhere to any SAE standard or recommended practice, and no commitment 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."

- 6.2 **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 (135)	1 (2)
0.050 and Over	180 (135)	2 (4)

When bend is made using a V-block, figures in parentheses apply.

- 6.3 **Tensile Properties After Heat Treatment:** Material which has been heated to $1650\text{ F} + 10$, cooled in still air to room temperature and tempered at $1000\text{ F} + 10$ for 1 hr shall be capable of meeting the following requirements:

Tensile Strength, psi	170,000 min
Yield Strength at 0.2% Offset, or at 0.0136 in. in 2 in. Extension Under Load ($E=29,000,000$), psi	140,000 min
Elongation, % in 2 in.	10 min

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.
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, heat 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.