



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 1000

AMS 5505A
Superseding AMS 5505

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STEEL SHEET, STRIP, AND PLATE, CORROSION AND MODERATE HEAT RESISTANT
12Cr (SAE 51410 Modified)
Ferrite Controlled

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **APPLICATION:** Primarily for parts and assemblies requiring uniformly high room temperature tensile properties along with oxidation resistance up to 1000 F (538 C) where control of ferrite content is necessary.
3. **COMPOSITION:**

	min	max
Carbon	0.12 -	0.15
Manganese	--	0.60
Silicon	--	0.50
Phosphorus	--	0.025
Sulfur	--	0.025
Chromium	11.50 -	12.50
Nickel	--	0.75
Molybdenum	--	0.20
Aluminum	--	0.05
Copper	--	0.50
Tin	--	0.05
Nitrogen	--	0.08

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

4. **CONDITION:** Unless otherwise ordered, the product shall be furnished in the following condition:

- 4.1 **Sheet:** Cold rolled, annealed, and descaled (No. 2D Finish).
- 4.2 **Strip:** Cold rolled, annealed, and descaled (No. 1 Strip Finish).
- 4.3 **Plate:** Hot rolled, annealed, and descaled.

5. **TECHNICAL REQUIREMENTS:**

- 5.1 **Tensile Properties:**

Tensile Strength, psi	95,000 max
Elongation, % in 2 in. or 4D	
Nominal Thickness, in.	
Up to 0.030, incl	15 min
Over 0.030	20 min

- 5.1.1 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.

- 5.2 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 axis of bend parallel to the direction of rolling.

Nominal Thickness Inch	Type of Bend	Angle deg, min	Bend Factor
Up to 0.375, incl	Free Bend	180	1
Up to 0.375, incl	V-Block	135	2
Over 0.375 to 0.500, incl	Free Bend	180	2
Over 0.375 to 0.500, incl	V-Block	135	4

- 5.3 Grain Size: Sheet and strip shall have grain size predominantly 5 or finer with occasional grains as large as 3 permissible, as determined by comparison of a polished and etched specimen with the chart in the issue of ASTM E112 specified in the latest issue of AMS 2350.

- 5.4 Properties after Heat Treatment: Material 3/8 in. and under in thickness and 3/8 in. thick specimens from heavier material shall be capable of meeting the following requirements when heated in a neutral atmosphere to $1700\text{ F} \pm 10$ ($926.7\text{ C} \pm 5.6$), held at heat for 1 hr, cooled in still air, and tempered twice at $600\text{ F} \pm 10$ ($315.6\text{ C} \pm 5.6$) for 2 hours:

5.4.1 Tensile Properties:

Tensile Strength, psi	180,000 min
Yield Strength at 0.2% Offset or at 0.0141 in. in 2 in. Extension Under Load ($E = 29,000,000$), psi	147,000 min
Elongation, % in 2 in. or 4D Nominal Thickness, in.	
Up to 0.035, incl	4 min
Over 0.035 to 0.070, incl	5 min
Over 0.070 to 0.110, incl	7 min
Over 0.110 to 0.150, incl	9 min
Over 0.150	11 min

- 5.4.2 Hardness: Shall be Rockwell C 39 - 44 or equivalent.

- 5.5 Ferrite Content: Material heat treated in accordance with 5.4 shall contain not more than 5% ferrite as determined by a method specified in the latest issue of AMS 2315.

6. QUALITY: Material shall conform to the latest issue of AMS 2303. The product shall be uniform in quality and condition, 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.

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, grain size, and AMS 2303 frequency-severity rating 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 and its revision letter, thickness, size, quantity from each heat, and method used to determine ferrite content.