

AERONAUTICAL MATERIAL SPECIFICATIONS

AMS 5504D

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STEEL SHEET AND STRIP, CORROSION RESISTANT 12.5Cr (SAE 51410)

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 oxidation resistance up to 1000 F, but useful at the higher temperatures only when stresses are low.
4. COMPOSITION:

Check Analysis Under Min or Over Max

Carbon	0.15 max	--	0.01
Manganese	1.00 max	--	0.03
Silicon	1.00 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	11.50 - 13.50	0.15	0.15
Nickel	0.75 max	--	0.03
Molybdenum	0.50 max	--	0.03
Aluminum	0.05 max	--	--
Copper	0.50 max	--	0.03
Tin	0.05 max	--	--

5. CONDITION:

- 5.1 Sheet: Cold rolled, annealed, and descaled (No. 2D Finish).
- 5.2 Strip: Cold rolled, annealed, and descaled (No. 1 Strip Finish).
- 5.3 Plate: Hot rolled, annealed, and descaled.

6. TECHNICAL REQUIREMENTS:

6.1 Tensile Properties:

Tensile Strength, psi	95,000 max
Elongation, % in 2 in.	
Nominal Thickness, inches	
0.030 and under	15 min
Over 0.030 in.	20 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. They are not to be used as a basis for legal action. The user of any technical report is advised to consult 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 Hardenability: Material $3/8$ in. and under in thickness and $3/8$ in. thick specimens from heavier material shall be capable of meeting the following test:

6.2.1 Specimens shall be heated to $1750\text{ F} + 10$, held at heat for 15 - 30 min., and cooled in still air. Hardness of such specimens shall be Rockwell C 35 - 45 or equivalent.

6.3 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.

ϕ	Nominal Thickness Inch	Type of Bend	Angle deg, min	Bend Factor
	0.375 and under	Free Bend	180	1
	0.375 and under	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

6.4 Grain Size: Sheet and strip shall have a grain size predominantly 5 or finer, with occasional grains as large as 3, as determined by comparison of a polished and etched specimen with the chart in ASTM E112-55T.

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, 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.

10. IDENTIFICATION: Unless otherwise specified, each plate, sheet, and strip shall be marked, in the respective location indicated below, with AMS 5504D, heat number, manufacturer's identification, and nominal thickness in inches. The characters shall be not less than $3/8$ in. in height, shall be applied using a suitable marking fluid, and shall be capable of being removed in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the material or its performance. The characters shall be sufficiently stable to withstand ordinary handling.