Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AEROSPACE MATERIAL SPECIFICATION

AMS 5504F
Superseding AMS 5504E
Issued 7-1-48
Revised 11-1-69

STEEL SHEET, STRIP, AND PLATE, CORROSION AND MODERATE HEAT 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. APPLICATION: Primarily for parts and assemblies requiring oxidation resistance up to 1000 F (538 C), but useful at the higher temperatures only when stresses are low.

3. COMPOSITION:

ø	min	max
Carbon	--	0.15
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	11.50	13.50
Nickel	--	0.75
Molybdenum	--	0.50
Aluminum	--	0.05
Nitrogen	--	0.08
Copper	--	0.50
Tin	--	0.05

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 supplied 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 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:

5.2.1 Specimens shall be heated to 1750 F ± 10 (954.4 C ± 5.6), held at heat for 15 - 30 min., and cooled in still air. Hardness of such specimens shall be Rockwell C 35 - 45 or equivalent.

5.3 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.

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

5.4 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.

6. QUALITY: When specified, steel 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 and for AMS 2303 frequency-severity rating when specified for 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, and quantity from each heat.

8.2 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 and its revision letter, 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.

9. IDENTIFICATION: Unless otherwise specified, each sheet, strip, and plate shall be marked on one face, in the respective location indicated below, with AMS 5504F, heat number, manufacturer's identification, and nominal thickness in inches. The characters shall be of such size as to be clearly legible, 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 and shall be sufficiently stable to withstand normal handling.

9.1 Flat Strip 6 In. and Under in Width: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 feet.

9.2 Flat Sheet, Flat Strip Over 6 In. in Width, and Plate: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 ft, the rows being spaced not more than 6 in. apart and alternately staggered.