AERONAUTICAL MATERIAL SPECIFICATIONS

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

AMS 6437

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Revised

STEEL SHEET AND STRIP
5Cr - 1.3Mo - 0.5V (0.38 - 0.43C)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. FORM: Sheet, strip, and plate.

3. APPLICATION: Primarily for parts requiring relatively high levels of strength, fatigue resistance, toughness, ductility, and thermal stability for operation up to 1000 F, and where such parts may require welding.

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.38 - 0.43	0.02	0.02
Manganese	0.20 - 0.40	0.03	0.03
Silicon	0.80 - 1.00	0.05	0.05
Phosphorus	0.020 max	--	0.005
Sulfur	0.020 max	--	0.005
Chromium	4.75 - 5.25	0.10	0.10
Molybdenum	1.20 - 1.40	0.04	0.04
Vanadium	0.40 - 0.60	0.03	0.03

5. CONDITION: Cold finished, annealed, and descaled or hot rolled, annealed, descaled and oiled, having a tensile strength not higher than 125,000 psi, unless otherwise ordered.

6. TECHNICAL REQUIREMENTS:

6.1 Decarburization: Material shall be free from complete decarburization. Partial decarburization shall not exceed the following when measured microscopically:

Nominal Thickness Inches	Depth of Decarburization Inch
0.065 and under	0.001
Over 0.065 to 0.090, incl	0.002
Over 0.090 to 0.125, incl	0.003
Over 0.125 to 0.250, incl	0.006
Over 0.250 to 0.375, incl	0.010
Over 0.375 to 0.500, incl	0.015
Over 0.500 to 1.000, incl	0.025
Over 1.000 to 2.000, incl	0.035

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6.2 Properties After Heat Treatment: Specimens austenitized by heating to 1850 F ± 25, holding at heat for 15 - 25 min., and cooling in air to room temperature and then tempered three times by heating to not lower than 975 F holding at heat for 2 - 3 hr, and cooling in air, shall conform to the following requirements:

6.2.1 Tensile Properties:

Tensile Strength, psi	260,000 min
Yield Strength at 0.2% Offset or at 0.0185 in. in 2 in. Extension Under Load (E = 30,400,000), psi	220,000 min
Elongation, % in 2 in.	5 min

6.2.1.1 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 specimens shall be taken with the axis parallel to the direction of rolling.

6.2.2 Hardness: Rockwell C 50 - 56 or equivalent, but hardness shall not be cause for rejection if tensile requirements are met.

6.2.3 Grain Size: Unless otherwise specified, grain size shall be predominantly 7 or finer with grains as large as 5 permissible, as determined by comparison of a polished and etched specimen with the chart in ASTM E112-55T.

6.2.4 Tensile Properties at 1000F: Material shall be capable of meeting the following requirements. Test specimens shall be heated to 1000 F ± 10, held at 1000 F ± 10 for 30 min., and tested at 1000 F ± 5. These properties apply when the rate of strain is maintained at 0.003 - 0.007 in. per in. per min. through the yield strength and then is increased so as to produce failure in approximately one additional minute.

Tensile Strength, psi	175,000 min
Yield Strength at 0.2% Offset or at 0.0157 in. in 2 in. Extension Under Load (E = 23,000,000), psi	135,000 min
Elongation, % in 2 in.	10 min

7. QUALITY: Steel shall be aircraft quality. Material 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.

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2252 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.

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