

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 6351

Issued 12-1-53

Revised

STEEL, SHEET AND STRIP
0.95Cr - 0.2Mo (0.28 - 0.33C) (SAE 4130)
Spheroidized

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: Generally used where deep drawing and forming are required. Sheet and strip are extensively used where minimum tensile strength of 160,000 psi is required in sections up to 0.125 in. thick and proportionately lower strength is required in heavier thicknesses.
4. COMPOSITION:

Check Analysis
Under Min or Over Max

Carbon	0.28 - 0.33	0.02	0.02
Manganese	0.40 - 0.60	0.03	0.03
Silicon	0.20 - 0.35	0.02	0.02
Phosphorus	0.040 max.	--	0.005
Sulfur	0.040 max.	--	0.005
Chromium	0.80 - 1.10	0.05	0.05
Molybdenum	0.15 - 0.25	0.02	0.02

5. CONDITION: Cold finished or hot rolled, spheroidize annealed, descaled and oiled, having hardness not higher than Rockwell B 85 or equivalent.
6. TECHNICAL REQUIREMENTS:
 - 6.1 Microstructure: Not less than 75% of the carbides shall be spheroidized.
 - 6.2 Hardenability: Material 0.249 in. and under in nominal thickness and thicker material reduced to 0.249 in. in thickness, when quenched in oil from 1600 F $\pm$ 10 and tempered at not lower than 900 F for 30 min. at heat, shall develop tensile strength not lower than 125,000 psi or hardness not lower than Rockwell C 26 or equivalent.
 - 6.3 Grain Size: Five or finer as determined on the rerolling slab, ASTM E19 method a. A heat of steel predominantly five or finer with grains as large as three is permissible.
 - 6.4 Decarburization: Material shall be free from decarburization to the extent that the increase in hardness from the surface to any point below the surface of an oil hardened specimen will not be more than the equivalent of 3 points on the Rockwell A scale.

Section 7C of the SAE Technical Board rules provides that: "All technical reports, drawings, 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."

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

Nominal Thickness Inch	Angle Degrees, Min	Bend Factor
0.249 and under	180 (135)	1 (2)
Over 0.249 to 0.749, incl	90 (135)	1 (3)

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

7. QUALITY: Product shall be suitable for use in aircraft. It shall be uniform in quality and condition, clean, sound, smooth, 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 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, hardness, grain size, and for bending properties of each thickness from each heat in the shipment. 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: Shall be according to 10.1, unless purchaser permits the methods in 10.2.

- 10.1 Each plate, sheet, and strip shall be marked, in the respective location indicated below, with AMS 6351, 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 characters shall be sufficiently stable to withstand ordinary handling.

- 10.1.1 Plate, Flat Sheet, and Flat Strip Over 6 in. in Width: Shall be marked in lengthwise rows of characters, recurring at intervals not greater than 2 ft, the rows being spaced not more than 3 in. apart and alternately staggered.