



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5085A

Superseding AMS 5085

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STEEL SHEET, STRIP, AND PLATE (0.47-0.55C) (SAE 1050) Annealed

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 stamped or formed parts which may subsequently be heat treated.

3. COMPOSITION:

	min	max
Carbon	0.47 - 0.55	
Manganese	0.60 - 0.90	
Silicon	0.10 - 0.35	
Phosphorus	--	0.040
Sulfur	--	0.050

3.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2259, paragraph titled "Carbon Steels, Sheet, Strip, Plate, and Flat Wire".

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

4.1 Sheet and Strip: Cold rolled and bright annealed; or hot rolled, annealed if necessary, and descaled, having hardness not higher than Rockwell B 85 or equivalent.

4.2 Plate: Hot rolled, annealed if necessary, and descaled, having hardness not higher than Rockwell B 85 or equivalent.

5. TECHNICAL REQUIREMENTS: When ASTM methods are specified for determining conformance to the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

5.1 Bending: Material shall withstand, without cracking, bending at room temperature through an angle of 180 deg around a diameter equal to twice the nominal thickness of the material with axis of bend parallel to the direction of rolling.

5.2 Decarburization:

5.2.1 Material Under 0.045 In. in Thickness: The method of test and the allowance shall be as agreed upon by purchaser and vendor.

5.2.2 Material 0.045 In. and Over in Thickness:

5.2.2.1 Specimens: Shall be the full thickness of the material except that specimens from plate over 0.250 in. thick shall be slices approximately 0.250 in. thick cut parallel to and preserving one original surface of the plate. Recommended specimen size is 1 x 4 inches.

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- 5.2.2.2 **Procedure:** Specimens shall be hardened by austenitizing and quenching; preferably, they shall not be tempered but, if tempered, the tempering temperature shall be not higher than 300 F (149 C). During heat treatment, specimens shall be protected by suitable atmosphere or medium or by suitable plating to prevent carburization or further decarburization. Protective plating, if used, shall then be removed from specimens of material 0.045 to 0.250, incl, in thickness and a portion of the specimen shall be step ground to a depth of 0.050 in. or half thickness, whichever is less. Specimens from material 0.250 in. and over in thickness shall be ground to remove from the original surface of the plate the amount of metal shown below and a portion of the specimen shall be ground to a depth of at least 1/3 the original thickness of the specimen. At least three Rockwell hardness readings shall be taken on each prepared step and each group of readings averaged.

Nominal Original Thickness Inches	Surface Depth Removal Inch
0.250 to 0.375, incl	0.020
Over 0.375 to 0.500, incl	0.025
Over 0.500 to 0.750, incl	0.030
Over 0.750 to 1.000, incl	0.035
Over 1.000 to 2.000, incl	0.040

5.2.2.3 **Allowance:**

- 5.2.2.3.1 **Material 0.045 to 0.250 In., Excl. Thick:** Unless otherwise specified, the product shall be free from complete decarburization. It shall also be free from partial decarburization to the extent that the difference in hardness between the surface and the nondecarburized depth below the surface shall be not greater than 2 points on the Rockwell A scale.

- 5.2.2.3.2 **Material 0.250 In. and Over Thick:** The difference in hardness between the two prepared steps shall be not greater than 2 points on the Rockwell C scale.

- 5.3 **Grain Size:** Predominantly 5 or finer with occasional grains as large as 3 permissible, ASTM E112, McQuaid-Ehn test.

6. **QUALITY:** The product 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.

7. **TOLERANCES:** Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2232.

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 of each heat in the shipment and the results of tests on each size 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 as in 9.1 unless purchaser permits a method from 9.2.