



AEROSPACE MATERIAL

Society of Automotive Engineers, Inc. SPECIFICATION

TWO PENNSYLVANIA PLAZA, NEW YORK, N. Y. 10001

AMS 6354A

Superseding AMS 6354

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STEEL SHEET, STRIP, AND PLATE
0.75Si - 0.62Cr - 0.20Mo - 0.10Zr (0.10-0.17C)

1. SCOPE:

1.1 Form: This specification covers a low-alloy steel in the form of sheet, strip, and plate.

1.2 Application: Primarily for parts requiring strength up to 1000 F (538 C).

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., Two Pennsylvania Plaza, New York, New York 10001.

2.1.1 Aerospace Material Specifications:

AMS 2252 - Tolerances, Alloy Steel Sheet, Strip, and Plate

AMS 2259 - Chemical Check Analysis Limits, Wrought Low Alloy and Carbon Steel

AMS 2350 - Standards and Test Methods

AMS 2370 - Quality Assurance Sampling of Carbon and Low Alloy Steel, Wrought Products Except Forgings

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

ASTM A370 - Mechanical Testing of Steel Products

ASTM E112 - Estimating Average Grain Size of Metals

ASTM E350 - Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Ave., Philadelphia, Pennsylvania 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E350, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods.

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	min	max
Carbon	0.10	0.17
Manganese	0.50	0.80
Silicon	0.60	0.90
Phosphorus	--	0.025
Sulfur	--	0.035
Chromium	0.50	0.75
Molybdenum	0.15	0.25
Zirconium	0.05	0.10
Nickel	--	0.25
Copper	--	0.35

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2259, paragraph titled "Low Alloy Steels".

3.2 Condition: The product shall be supplied in the following condition:

3.2.1 Sheet and Strip: Hot rolled, or cold rolled and annealed, and descaled.

3.2.2 Plate: Hot rolled and descaled.

3.3 Properties: The product shall conform to the following requirements; tensile and bend testing shall be performed in accordance with ASTM A370:

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

3.3.2 Tensile Properties: Shall be as specified in Table I:

TABLE I

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation in 2 in. or 4D %, min
Up to 0.5, incl	70,000	50,000	22
Over 0.5 to 1.0, incl	65,000	43,000	22
Over 1.0 to 2.0, incl	63,000	40,000	22
Over 2.0 to 4.0, incl	60,000	38,000	22

TABLE I (SI)

Nominal Thickness Millimeters	Tensile Strength MN/m ² , min	Yield Strength at 0.2% Offset MN/m ² , min	Elongation in 50.8 mm or 4D %, min
Up to 12.7, incl	483	345	22
Over 12.7 to 25.4, incl	448	296	22
Over 25.4 to 50.8, incl	434	276	22
Over 50.8 to 101.6, incl	414	262	22

3.3.2.1 Tensile properties of plate over 4.0 in. (101.6 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3.3 Bending: Material shall withstand, without cracking, bending through the angle indicated in Table II 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.

TABLE II

Nominal Thickness Inch	Type of Bend	Angle deg, min	Bend Factor
Up to 0.249, incl	Free Bend	180	1
	V-Block	135	2
Over 0.249 to 0.749, incl	Free Bend	90	1
	V-Block	135	3

TABLE II (SI)

Nominal Thickness Millimeters	Type of Bend	Angle rad, min	Bend Factor
Up to 6.325, incl	Free Bend	3.14	1
	V-Block	2.36	2
Over 6.325 to 19.024, incl	Free Bend	1.57	1
	V-Block	2.36	3

3.4 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.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of AMS 2252.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that the product conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as routine control tests.

4.3 Sampling: Shall be in accordance with all applicable requirements of AMS 2370 and the following:

4.3.1 Tensile test specimens from widths 9 in. (229 mm) and over shall be taken with the axis perpendicular to the direction of rolling, for widths less than 9 in. (229 mm), specimens shall be taken with the axis parallel to the direction of rolling.

4.4 Reports:

4.4.1 The vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition and grain size of each heat in the shipment and the results of tests on each size from each heat to determine conformance to the tensile property and bending requirements. This report shall include the purchase order number, heat number, material specification number and its revision letter, thickness, size, and quantity from each heat.

4.4.2 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, the 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.