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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5046B

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Superseding AMS 5046A

Carbon Steel, Sheet, Strip, and Plate
(SAE 1020 and 1025)
Annealed

(Compositions similar to UNS G10200 and G10250)

1. SCOPE:

1.1 Form:

This specification covers two types of carbon steel in the form of sheet, strip, and plate.

1.2 Application:

These products have been used typically for use in fabrication of fittings, but usage is not limited to such applications. These products are not typically used for deep forming or cupping operations.

1.3 Classification:

The steels covered by this specification are classified as follows:

Type 1 0.17 to 0.23 Carbon
Type 2 0.22 to 0.28 Carbon

1.3.1 Unless a specific type is ordered, either type may be supplied.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
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SAE WEB ADDRESS: http://www.sae.org

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2232	Tolerances, Carbon Steel Sheet, Strip, and Plate
MAM 2232	Tolerances, Metric, Carbon Steel Sheet, Strip, and Plate
AMS 2259	Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2370	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock
AMS 2807	Identification, Carbon and Low-Alloy Steels, Corrosion and Heat Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM A 370	Mechanical Testing of Steel Products
ASTM E 112	Determining Average Grain Size
ASTM E 350	Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-H-6875	Heat Treatment of Steel, Process for

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 350, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	Type 1 min	Type 1 max	Type 2 min	Type 2 max
Carbon	0.17	0.23	0.22	0.28
Manganese	0.30	0.60	0.30	0.60
Phosphorus	--	0.040	--	0.040
Sulfur	--	0.050	--	0.050

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2259.

3.2 Condition:

The product shall be supplied in the following condition; annealing shall be performed in accordance with MIL-H-6875 as specified for alloy 1025 for both Type 1 and Type 2.

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

3.2.2 Plate: Hot rolled, annealed, and descaled.

3.3 Properties:

The product shall conform to the following requirements; tensile and bend tests shall be performed in accordance with ASTM A 370:

3.3.1 Tensile Properties: Shall be as shown in Table 2:

TABLE 2 - Minimum Tensile Properties

Property	Value
Tensile Strength	55 ksi (379 MPa)
Yield Strength at 0.2% Offset	36 ksi (248 MPa)
Elongation in 2 Inches (50.8 mm) or 4D	22%

3.3.1.1 For each 2 ksi (13.8 MPa) in excess of 55 ksi (379 MPa) tensile strength, a reduction in elongation of 1% to a minimum of 10% is permissible.

3.3.2 Bending: Sheet and strip shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the nominal thickness of the product, with axis of bend parallel to the direction of rolling.

3.3.3 Average Grain Size: Shall be ASTM No. 5 or finer, determined in accordance with ASTM E 112 (See 8.2).

3.4 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances:

Shall conform to all applicable requirements of AMS 2232 or MAM 2232.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests:

All technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Testing:

Shall be in accordance with AMS 2370 and the following:

4.3.1 When a statistical sampling plan has been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3, and the report of 4.4 shall state that such plan was used.

4.4 Reports:

The vendor of the product shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for tensile properties, bending and average grain size of each lot, and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS 5046B, size, and quantity.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2370.