

AEROSPACE MATERIAL SPECIFICATION

AMS 5040M

Issued 1940-03
Revised 2006-05
Reaffirmed 2010-10
Superseding AMS 5040L

Steel, Sheet and Strip
0.15 Carbon, Maximum
Deep Forming Grade

(Composition similar to UNS G10100)

RATIONALE

AMS 5040M is a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers a carbon steel in the form of sheet and strip.

1.2 Application

These products have been used typically for deep drawn and formed parts requiring a steel of high ductility, but usage is not limited to such applications.

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 cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), or www.sae.org.

AMS 2232	Tolerances, 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

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2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P. O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, or www.astm.org.

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

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	min	max
Carbon	--	0.15
Manganese	0.30	0.60
Phosphorus	--	0.035
Sulfur	--	0.040

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS 2259.

3.2 Condition

Product shall be supplied annealed, dead soft.

3.3 Properties

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

3.3.1 Hardness

Shall be not higher than shown in Table 2, or equivalent (See 8.2):

TABLE 2 - MAXIMUM HARDNESS

Nominal Thickness Inch	Nominal Thickness Millimeters	Hardness
0.009 to 0.014, incl	0.23 to 0.36, incl	99 HV (1 kg Load)
Over 0.014 to 0.027, incl	Over 0.36 to 0.69, incl	79 HR15T
Over 0.027 to 0.059, incl	Over 0.69 to 1.50, incl	53 HR30T
Over 0.059 to 0.089, incl	Over 1.50 to 2.26, incl	88 HRF
Over 0.089	Over 2.26	55 HRB

3.3.2 Bending

The product shall withstand, without cracking or producing an "orange peel" surface, bending at room temperature flat on itself with axis of bend parallel to the direction of rolling.

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.

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.

4.4 Reports

The vendor of the product shall furnish with each shipment a report showing the results of tests for composition of each heat and for hardness and bending 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 5040M, size, and quantity.

4.5 Resampling and Retesting

Shall be in accordance with AMS 2370.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with AMS 2807.

5.2 Protective Treatment

Product shall be protected from corrosion prior to shipment.

5.3 Packaging

The product shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.