# AEROSPACE MATERIAL SPECIFICATION

| AMS5044™ | REV. L |
|---|---|

Issued 1942-12
Reaffirmed 2013-10
Revised 2024-12

Superseding AMS5044K

# Steel, Sheet and Strip, 0.15 Carbon, Maximum (SAE 1010), Half Hard Temper

(Composition similar to UNS G10100)

RATIONALE

AMS5044L is the result of a Five-Year Review and update of the specification. The revision updates composition reporting (see 3.1.1), clarifies bend test requirements (see 3.3.2), and updates the exclusions requirements (see 4.4.2 and 8.5).

## 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 stamped parts and/or parts requiring bending only normal to the direction of rolling, 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 +1 724-776-4970 (outside USA), www.sae.org.

AMS2232 Tolerances, Carbon Steel, Sheet, Strip, and Plate

AMS2259 Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels

AMS2370 Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock





**TO PLACE A DOCUMENT ORDER:** **Tel: 877-606-7323 (inside USA and Canada)**
**Tel: +1 724-776-4970 (outside USA)**
**Fax: 724-776-0790**
**Email: CustomerService@sae.org**
**SAE WEB ADDRESS:** **http://www.sae.org**

**For more information on this standard, visit**
https://www.sae.org/standards/content/AMS5044L/

AMS2807 Identification, Carbon and Low-Alloy Steels, Corrosion- and Heat-Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

AS7766 Terms Used in Aerospace Metals Specifications

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, www.astm.org.

ASTM A370 Mechanical Testing of Steel Products

ASTM A751 Chemical Analysis of Steel Products

ASTM E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

ASTM E290 Standard Test Methods for Bend Testing of Material for Ductility

2.3 Definitions

Terms used in AMS are defined in AS7766 and the following:

HALF HARD: Half hard temper is a general term that refers to a relative hardness (when compared to a possible maximum) that is obtained by the selection and control of composition, cold work, cold finish, and thermal treatment.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Composition shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM A751 or by other analytical methods acceptable to the purchaser.

***Table 1 - Composition***

| Element | Min | Max |
|---|---|---|
| Carbon | -- | 0.15 |
| Manganese | 0.30 | 0.60 |
| Phosphorus | -- | 0.035 |
| Sulfur | -- | 0.040 |



3.1.1 The producer may test for any element not listed in Table 1 and include this analysis in the report of 4.4. Reporting of any element not listed in the composition table is not a basis for rejection, unless limits of acceptability are specified by the purchaser.

3.1.2 Check Analysis

Composition variations shall meet the applicable requirements of AMS2259.

3.2 Condition

Product shall be cold rolled.

3.3 Properties

The product shall conform to the following requirements; hardness and bend tests shall be performed in accordance with ASTM A370:

3.3.1 Hardness

Hardness shall be as shown in Table 2, or equivalent (see 8.2).

***Table 2 - Hardness***

| Nominal Thickness Inches | Nominal Thickness Millimeters | Hardness |
|---|---|---|
| 0.009 to 0.017, incl | 0.23 to 0.43, incl | 83.5 to 89 HR15T |
| Over 0.017 to 0.032, incl | Over 0.43 to 0.81, incl | 63.5 to 74 HR30T |
| Over 0.032 to 0.054, incl | Over 0.81 to 1.37, incl | 96 to 105 HRF |
| Over 0.054 | Over 1.37 | 70 to 85 HRB |

3.3.2 Bending

The product shall be tested in accordance with ASTM E290. Transverse testing shall be performed at room temperature. Bend requirements shall be in accordance with Table 3. When visually examined, the specimen shall exhibit no cracking. In case of dispute, the results of tests using the guided bend test of ASTM E290 shall apply.

***Table 3 - Bend test***

| Nominal Thickness | Angle Degrees | Bend Radius(1)(2) |
|---|---|---|
| All | 90 min | 1t |

(1) Bend radius is defined as a bend factor multiplied by the nominal thickness (t).
(2) Prior versions of this specification may have specified a bend factor and a bend diameter in lieu of bend radius.

3.4 Quality

The product, as received by the 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

Tolerances shall conform to all applicable requirements of AMS2232.

3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.2.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The 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

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

4.3 Sampling and Testing

Sampling and testing shall be in accordance with AMS2370.

4.4 Reports

4.4.1 The producer of the product shall furnish with each shipment a report showing the results of tests for composition of each heat and hardness and bending properties 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, AMS5044L, size, and quantity.

4.4.2 When material produced to this specification has exceptions to the technical requirements listed in Section 3, the report shall contain a statement “This material is certified as AMS5044L(EXC) because of the following exceptions:” and the specific exceptions shall be listed (see 5.1).

4.5 Resampling and Retesting

Resampling and retesting shall be in accordance with AMS2370.

5. PREPARATION FOR DELIVERY

5.1 Identification

Identification shall be in accordance with AMS2807. When technical exceptions are taken (see 4.4.2), the material shall be marked with AMS5044L(EXC).

5.2 Protective Treatment

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

7. REJECTIONS

Product not conforming to this specification, or to modifications authorized by the purchaser, will be subject to rejection.

8. NOTES

8.1 Revision Indicator

A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.