



AEROSPACE MATERIAL SPECIFICATION

AMS5120™**REV. P**

Issued 1942-03
Reaffirmed 2013-10
Revised 2023-03

Superseding AMS5120N

Steel Strip
0.68 - 0.80C (SAE 1074)
Composition similar to UNS G10740)

RATIONALE

AMS5120P is the result of a limited scope ballot. A typographical error was identified in the bend properties and Table 2 is corrected accordingly.

1. SCOPE

1.1 Form

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

1.2 Application

This product has been used typically for heat treated springs, spring pins, shims, spacers, and other applications where spring temper is required, 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
AMS2807	Identification, Carbon and Low-Alloy Steels, Corrosion- and Heat-Resistant Steels and Alloys Sheet, Strip, Plate, and Aircraft Tubing
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications

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For more information on this standard, visit
<https://www.sae.org/standards/content/AMS5120P/>

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 Standard Test Methods, Practices, and Terminology for 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 Bend Testing of Material for Ductility

ASTM E384 Microindentation Hardness of Materials

3. TECHNICAL REQUIREMENTS

3.1 Composition

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

Table 1 - Composition

Element	Min	Max
Carbon	0.68	0.80
Manganese	0.50	0.80
Silicon	0.10	0.30
Phosphorus	--	0.040
Sulfur	--	0.050

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2259.

3.2 Condition

Strip shall be supplied in the following condition; hardness shall be determined in accordance with ASTM A370:

3.2.1 0.063 Inch (1.60 mm) and Under in Nominal Thickness

Cold rolled and annealed having hardness not higher than 85 HRB, or equivalent (see 8.2).

3.2.2 Over 0.063 Inch (1.60 mm) in Nominal Thickness

Cold rolled and annealed, or hot rolled, annealed, and descaled, having hardness not higher than 85 HRB, or equivalent (see 8.2).

3.3 Properties

Strip shall conform to the following requirements; hardness tests shall be performed in accordance with ASTM A370:

3.3.1 Decarburization

Depending on thickness of the product, decarburization may be measured by a HR30N hardness step test method, or by the microhardness traverse method. Additionally, the metallographic method shall be used in part (see 3.3.1.4.1) to inspect product.

3.3.1.1 In the case of dispute, the microhardness method, conducted in accordance with ASTM E384, shall govern. The allowance for decarburization shall be that which would have been applicable had the step method been used (see 3.3.1.4.1).

3.3.1.2 Specimens

Shall be full thickness of the product. Recommended minimum specimen size is 1 x 4 inches (25 x 102 mm). A full cross section metallographic sample shall be prepared to inspect for presence of complete decarburization (ferrite).

3.3.1.3 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.

3.3.1.4 Protective plating, if used to prevent any decarburization during hardening, shall be removed, and a portion of the specimen shall be ground with copious coolant to prevent thermal or mechanical effects to a depth of 0.050 inch (1.27 mm) or one-half thickness, whichever is less.

3.3.1.4.1 Allowance

The product shall show no layer of complete decarburization (ferrite) determined metallographically at a magnification not exceeding 100X. It shall also be free from any partial decarburization to the extent that the difference in hardness between the original surface and the surface (depth) generated by grinding as in 3.3.1.4 shall not be greater than two units on the HRA scale or equivalent (see 8.2 and 3.3.1.1).

3.3.2 Bending

Strip shall be tested in accordance with ASTM E290 using a sample prepared nominally 0.75 inch (19.0 mm) in width with its axis of bending parallel to the direction of rolling and shall withstand without cracking when bending at room temperature through the angle and bend radius shown in Table 2. If the bend cannot be performed with the axis parallel to the direction of rolling, bending shall be done with the axis perpendicular to the direction of rolling around a radius equal to one-half the nominal thickness of the strip. In case of dispute, the results of tests using the guided bend test of ASTM E290 shall govern.

Table 2 - Bend requirements

Bend Angle Degrees	Bend Radius t = nominal thickness
180	1t

3.4 Quality

Strip, 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 strip.

3.5 Tolerances

Shall conform to AMS2232.

3.6 Exceptions

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

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of strip 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 strip conforms to specified requirements.

4.2 Classification of Tests

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

4.3 Sampling

Shall be in accordance with AMS2370.

4.4 Reports

4.4.1 The producer of strip shall furnish with each shipment a report showing the results of tests for composition of each heat and for hardness 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, AMS5120P, size, product form, and quantity.

4.4.2 When material produced to this specification is beyond the sizes allowed in the scope or tables, or exceptions authorized by purchaser are taken to the technical requirements listed in Section 3, the report shall contain a statement "This material is certified as AMS5120P(EXC) because of the following exceptions:" and the specific exceptions shall be listed (see 5.1).

4.5 Resampling and Retesting

Shall be in accordance with AMS2370.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with AMS2807. When technical exceptions are taken (see 4.4.2), the material shall be marked with AMS5120P(EXC).

5.2 Protective Treatment

Strip shall be protected from corrosion prior to shipment.

5.3 Packaging

Strip 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 strip to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

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

7. REJECTIONS

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