



AEROSPACE MATERIAL SPECIFICATION

AMS5121**REV. K**

Issued 1942-06
Revised 2010-08
Reaffirmed 2015-05

Superseding AMS5121J

Sheet and Strip, Steel
(0.90 - 1.04C) (SAE 1095)
Annealed

(Composition similar to UNS G10950)

RATIONALE

AMS5121K has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE

1.1 Form

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

1.2 Application

This material has been used typically for heat treated springs, 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 724-776-4970 (outside USA) or 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

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<http://www.sae.org/technical/standards/AMS5121K>**

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 112 Determining Average Grain Size

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 following 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	0.90	1.04
Manganese	0.30	0.50
Silicon	0.15	0.35
Phosphorus	—	0.040
Sulfur	—	0.050

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2259.

3.2 Condition

Product shall be supplied in the following conditions; hardness shall be determined in accordance with ASTM A 370:

3.2.1 Nominal Thickness 0.063 Inch (1.60 mm) and Under

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

3.2.2 Nominal Thicknesses Over 0.063 Inch (1.60 mm)

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

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

3.3.1 Average Grain Size

Shall be ASTM No. 5 or finer, determined in accordance with ASTM E 112.

3.3.2 Decarburization

3.3.2.1 Specimens

Shall be the full thickness of the product. Recommended specimen size is 1 × 4 inches (25 × 102 mm).

3.3.2.2 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 decarburization. Protective plating, if used, shall then be removed and a portion of the specimen shall be ground to a depth of 0.050 inch (1.27 mm) or one-half thickness, whichever is less. At least three Rockwell hardness readings shall be taken on each prepared step and each group of readings averaged.

3.3.2.3 Allowance

The product shall show no layer of complete decarburization, determined microscopically at a magnification not exceeding 100X. It shall also be free from partial decarburization to the extent that the difference in hardness between the original surface and the portion ground as in 3.3.2.2 shall be not greater than 2 units on the Rockwell Superficial 30N scale.

3.3.3 Bending

The product shall withstand, without cracking, free bending through an angle of 180 degrees around a diameter equal to twice the nominal thickness of the product with axis of bend parallel to the direction of rolling. If the bend cannot be made with the axis parallel to the direction of rolling, bending shall be done with the axis perpendicular to the direction of rolling around a diameter equal to the nominal thickness of the product.

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 strip.

3.5 Tolerances

Shall conform to all applicable requirements of AMS2232.

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

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

4.3 Sampling and Testing

In accordance with AMS2370.

4.4 Reports

The vendor of the product shall furnish with each shipment a report showing the results of composition for each heat and average grain size for 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, AMS5121K, product form, size, and quantity.

4.5 Resampling and Retesting

In accordance with AMS2370.

5. PREPARATION FOR DELIVERY

5.1 Identification

In accordance with AMS2807.

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 vendor shall include 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 purchaser, will be subject to rejection.

8. NOTES

8.1 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.

8.2 Hardness conversion tables for metals are presented in ASTM E 140.

8.3 Terms used in AMS are clarified in ARP1917.

8.4 Dimensions in inch/pound units and the Fahrenheit temperatures are primary; dimensions in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.5 Purchase documents should specify not less than the following:

AMS5121K

Product form and size of product desired

Quantity of product desired.