



<b>AEROSPACE MATERIAL SPECIFICATION</b>	<b>AMS5121™</b>	<b>REV. L</b>
	Issued 1942-06 Reaffirmed 2015-05 Revised 2019-05  Superseding AMS5121K	
Sheet and Strip, Steel (0.90 - 1.04C) (SAE 1095) Annealed (Composition similar to UNS G10950)		

### RATIONALE

AMS5121L results from a Five-Year Review and update of this specification that revises composition analytical methods (3.1), prohibits unauthorized exceptions (3.6), and revises reporting (4.4) and identification (5.1).

#### 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.

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## 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](http://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

## 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](http://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 E112	Determining Average Grain Size

## 3. TECHNICAL REQUIREMENTS

### 3.1 Composition

Shall conform to the following percentages by weight shown in Table 1, determined in accordance with ASTM A751 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 A370:

#### 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 A370:

#### 3.3.1 Average Grain Size

Shall be ASTM No. 5 or finer, determined in accordance with ASTM E112.

#### 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 two 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.

### 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 the product shall supply all samples for producer'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

4.4.1 The producer 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, AMS5121L, product form, size, 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 AMS5121L(EXC) because of the following exceptions:" and the specific exceptions shall be listed (see 5.1).

### 4.5 Resampling and Retesting

In accordance with AMS2370.

## 5. PREPARATION FOR DELIVERY

### 5.1 Identification

In accordance with AMS2807. When technical exceptions are taken (see 4.4.2), the material shall be marked with AMS5121L(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 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.