Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 5122D
Superseding AMS 5122C

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STEEL STRIP
(0.90 - 1.04C) (SAE 1095)
Hard Temper

1. SCOPE:

1.1 Form: This specification covers a high-carbon steel in the form of cold-worked strip.

1.2 Application: Primarily for washers and other stamped parts requiring a smooth finish and only slight or no forming.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

2.1.1 Aerospace Material Specifications:

AMS 2232 - Tolerances, Carbon Steel Sheet, Strip, and Plate
AMS 2259 - Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2350 - Standards and Test Methods
AMS 2370 - Quality Assurance Sampling of Carbon and Low-Alloy Steels, Wrought Products Except Forgings and Forging Stock

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

ASTM A370 - Mechanical Testing of Steel Products
ASTM E112 - Estimating the Average Grain Size of Metals
ASTM E350 - Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E350, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

	min	max
Carbon	0.90	1.04
Manganese	0.30	0.50
Silicon	0.15	0.30
Phosphorous	--	0.040
Sulfur	--	0.050

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2259.

3.2 Condition: Cold finished, hard temper.

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

3.3.1 Grain Size: Predominantly 5 or finer with occasional grains as large as 3 permissible, determined by comparison of a polished and etched specimen with the chart in ASTM E112.

3.3.2 Hardness: 47 - 52 HRC or equivalent.

3.3.3 Decarburization:

3.3.3.1 Product Under 0.045 In. (1.14 mm) in Thickness: The method of test and the allowance shall be as agreed upon by purchaser and vendor.

3.3.3.2 Product 0.045 In. (1.14 mm) and Over in Thickness:

3.3.3.2.1 Specimens: Shall be the full thickness of the product. Recommended specimen size is Ø 1 x 4 in. or 25 x 100 mm.

3.3.3.2.2 Procedure: A portion of the specimen shall be ground to a depth of 0.050 in. (1.27 mm) or one-half thickness, whichever is less. At least three Rockwell hardness readings shall be taken on the original surface and on the ground portion and each group of readings averaged.

3.3.3.2.3 Allowance: The product shall show no layer of complete decarburization as 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 3.3.3.2.2 shall be not greater than 2 units on the Rockwell "A" scale.

3.3.4 Bending: The product or finished parts shall be capable of bending sufficiently to take a permanent deformation without cracking, with axis of bend parallel to the direction of rolling.

3.3.5 Finish: The product shall have a bright finish as produced by cold rolling or polishing. A clean, blue finish as produced by heating at low temperature is acceptable.

3.4 Quality: The product shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

3.5 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of Ø AMS 2232.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of strip shall supply all samples and shall be responsible for Ø performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that the strip conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification Ø are classified as acceptance or routine control tests.

Ø 4.3 Sampling: Shall be in accordance with AMS 2370.

4.4 Reports:

4.4.1 Ø The vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each heat in the shipment and for hardness of each size from each heat. This report shall include the purchase order number, material specification number and its revision letter, size, and quantity from each heat.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

4.5 Ø Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the strip may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the strip represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each strip shall be marked as in 5.1.1 unless purchaser permits a method from 5.1.2.

5.1.1 Each strip shall be marked on one face, in the respective location indicated below, with AMS 5122D, heat number, manufacturer's identification, and nominal thickness. The characters shall be of such size as to be clearly legible, shall be applied using a suitable marking fluid, and shall be capable of being removed in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the material or its performance and shall be sufficiently stable to withstand normal handling. The specification number, manufacturer's identification, and nominal thickness shall be continuously line marked; the heat number may be included in the line marking or may be marked at one location on each piece.

5.1.1.1 Flat Strip 6 In. (152 mm) and Under in Width: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 ft (914 mm).

5.1.1.2 Flat Strip Over 6 In. (152 mm) in Width: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 ft (914 mm), the rows being spaced not more than 6 in. (152 mm) apart and alternately staggered.

5.1.1.3 Ø Coiled Strip: Shall be marked near both the outside and inside ends of the coil; the marking at either or both ends shall be applied as in 5.1.1 or shall appear on a durable tag or label attached to the coil and marked with the information of 5.1.1. When the inside end of the coil is inaccessible, as when the product is wound on cores, the tag or label may be attached to the core.

5.1.2 Ø When purchaser permits, each strip may be marked near one end, coils being marked near the outside end, with AMS 5122D, heat number, manufacturer's identification, and nominal thickness, using any suitable marking fluid. As an alternate method, individual pieces and bundles shall have attached a metal or plastic tag embossed with the above information or shall be boxed and the box marked with the same information.

5.2 Protective Treatment: The product shall be oiled prior to shipment.

5.3 Packaging: The product shall be prepared for shipment in accordance with commercial practice to assure carrier acceptance and safe transportation to the point of delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.