

Steel, Low Carbon

1. SCOPE:

1.1 Form: This specification covers low-carbon steel in the form of bars, forgings, mechanical tubing, sheet, strip, plate, and forging stock.

1.2 Application: Parts for which a wide latitude in composition is permissible and requiring no particular strength or hardness other than that inherent in steel of this type. Care is required in welding in the event that carbon and manganese approach the maximum limits.

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 Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2231 - Tolerances, Carbon Steel Bars

AMS 2232 - Tolerances, Carbon Steel Sheet, Strip, and Plate

AMS 2253 - Tolerances, Carbon and Alloy Steel Tubing

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

AMS 2372 - Quality Assurance Sampling of Carbon and Low-Alloy Steels, Forgings and Forging Stock

AMS 2808 - Identification, Forgings

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

ASTM E350 - Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

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

2.3.1 Federal Standards:

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

2.3.2 Military Standards:

MIL-STD-163 - Steel Mill Products, Preparation for Shipment and Storage

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### 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 analytical methods approved by purchaser:

	min	max
Carbon	--	0.25
Manganese	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.050

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

- 3.2 Condition: The product shall be supplied in the following condition:

- 3.2.1 Bars and Mechanical Tubing 2.50 In. (62.5 mm) and Under in Nominal OD or Distance Between Parallel Sides: Cold finished.

- 3.2.2 Bars and Mechanical Tubing Over 2.50 In. (62.5 mm) in Nominal OD or Distance Between Parallel Sides: Hot finished and normalized or otherwise heat treated to produce optimum machinability.

- 3.2.3 Forgings: Normalized or otherwise heat treated to produce optimum machinability.

- 3.2.4 Sheet, Strip, and Plate: As rolled.

- 3.2.5 Forging Stock: As ordered by the forging manufacturer.

- 3.3 Quality: The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to usage of the product.

- 3.4 Sizes: Except when exact lengths or multiples of exact lengths are ordered, straight bars and tubing will be acceptable in mill lengths of 6 - 20 ft (1.8 - 6.1 m) but not more than 10% of any shipment shall be supplied in lengths shorter than 10 ft (3 m).

- 3.5 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of the following:

- 3.5.1 Bars: AMS 2231.

- 3.5.2 Mechanical Tubing: AMS 2253.

- 3.5.3 Sheet, Strip, and Plate: AMS 2232.

### 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 performing all required tests. Results of such tests shall be reported to the purchaser, as required by 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

- 4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling: Shall be in accordance with the following:

4.3.1 Bars, Mechanical Tubing, Sheet, Strip, and Plate: AMS 2370.

4.3.2 Forgings and Forging Stock: AMS 2372.

4.4 Reports:

4.4.1 The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests for chemical composition of each heat. This report shall include the purchase order number, heat number, AMS 5062D, size, and quantity from each heat. If forgings are supplied, the part number and the size and melt source of stock used to make the forgings shall also be included.

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, AMS 5062D, 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 Resampling and Retesting: Shall be in accordance with the following:

4.5.1 Bars, Mechanical Tubing, Sheet, Strip, and Plate: AMS 2370.

4.5.2 Forgings and Forging Stock: AMS 2372.

5. PREPARATION FOR DELIVERY:

5.1 Identification: The product shall be identified as follows:

5.1.1 Bars and Tubing: Individual pieces or bundles shall have attached a durable tag marked with the purchase order number, AMS 5062D, and nominal size or shall be boxed and the box marked with the same information.

5.1.2 Forgings: In accordance with AMS 2808.

5.1.3 Sheet, Strip, and Plate: Each sheet, strip, and plate shall be marked as in 5.1.3.1 unless purchaser permits a method from 5.1.3.2.

5.1.3.1 Each sheet, strip, and plate shall be marked on one face, in the respective location indicated below, with AMS 5062D, manufacturer's identification, and nominal thickness. The characters shall be of such size as to be legible, shall be applied using a suitable marking fluid, and shall be removable in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the product 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.

5.1.3.1.1 Flat Strip 6 In. (150 mm) and Under in Width: Shall be marked in one or more lengthwise rows of characters recurring at intervals not greater than 3 ft (900 mm).

5.1.3.1.2 Flat Sheet, Flat Strip Over 6 In. (150 mm) in Width, and Plate: Shall be marked in lengthwise rows of characters recurring at intervals not greater than 3 ft (900 mm), the rows being spaced not more than 6 in. (150 mm) apart and alternately staggered.