



# AEROSPACE MATERIAL

Society of Automotive Engineers, Inc.

400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

# SPECIFICATION

## AMS 5010G

Superseding AMS 5010F

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UNS G12120

### STEEL BARS Free Machining (SAE 1212 or SAE 1215)

#### 1. SCOPE:

1.1 Form: This specification covers a free-machining carbon steel in the form of bars.

1.2 Application: Primarily for screw stock and other applications where free-machining characteristics are desirable.

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 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 2806 - Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and  
Alloy Steels and Heat and Corrosion Resistant Steels and Alloys

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

ASTM E10 - Brinell Hardness of Metallic Materials

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 one of the following types in 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:

	<u>Type 1212</u>		<u>Type 1215</u>	
	min	max	min	max
Carbon	--	0.13	--	0.09
Manganese	0.70	1.00	0.75	1.05
Phosphorus	0.07	0.12	0.04	0.09
Sulfur	0.16	0.23	0.26	0.35

3.1.1 Either type may be supplied unless a specific type is ordered.

3.1.2 Check Analysis: Composition variation shall meet the applicable requirements of AMS 2259.

3.2 Condition: Cold drawn.

3.3 Properties: Bars shall conform to the following requirements:

3.3.1 Hardness: Shall be as follows or equivalent, determined in accordance with ASTM E10:

<u>Nominal Diameter or Distance Between Parallel Sides</u>		<u>Hardness</u> HB
<u>Inches</u>	<u>(Millimetres)</u>	
Up to 1.00, incl	(Up to 25.0, incl)	170 - 255
Over 1.00 to 2.00, excl	(Over 25.0 to 50.0, excl)	156 - 201
2.00 and over	(50.0 and over)	110 - 201

3.4 Quality: Bars, as received by purchaser, shall be uniform in quality and condition, sound, and consistent with the type of steel involved, free from foreign materials and from internal and external imperfections detrimental to usage of the bars.

3.5 Sizes: Except when exact lengths or multiples of exact lengths are ordered, straight bars 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).

3.6 Tolerances: Unless otherwise specified, tolerances shall conform to all applicable requirements of AMS 2231.

### 4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of bars 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 such confirmatory testing as he deems necessary to ensure that the bars conform 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 lot.

4.3 Sampling: Shall be in accordance with AMS 2370.

4.4 Reports: