

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5022E

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STEEL, FREE CUTTING (0.14-0.20C) (SAE 1117)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. FORM: Bars, billets, forgings, and mechanical tubing.

3. COMPOSITION:

		Check Analysis	
		Under Min	Over Max
Carbon	0.14 - 0.20	0.02	0.02
Manganese	1.00 - 1.30	0.06	0.06
Phosphorus	0.040 max	--	0.008
Sulfur	0.08 - 0.13	--	--

Note: When agreed upon by purchaser and vendor, manganese up to 1.60 is permitted.

4. CONDITION:

4.1 Bars and Tubing 2.5 in. and Less in Diameter or Distance between Parallel Sides: Cold finished and suitable for machining on high-speed automatic screw machines.

4.2 Forgings and Bars and Tubing over 2.5 in.: Normalized or otherwise heat treated to produce best machining qualities.

4.2.1 Forgings: Shall not be supplied except when specified on the drawing or purchase order.

4.3 Forging Stock: As ordered by the forging manufacturer.

5. TECHNICAL REQUIREMENTS:

5.1 Hardness: The product shall have hardness as follows, or equivalent, when taken on the surface, except on rounds, where a flat as necessary for Brinell accuracy may be made:

5.1.1 Bars:

Nominal Diameter or Distance between parallel sides Inches	Hardness, Brinell
Under 1.0	156 - 207
1.0 to 2.5, incl	143 - 197
Over 2.5	130 - 179

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5.1.2 Tubing:

Nominal OD Inches	Hardness, Brinell
Under 1.0	156 - 207
1.0 to 2.5, incl	143 - 197
Over 2.5	130 - 179

5.1.3 Forgings: Brinell 130-179

6. **QUALITY:** Material shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external defects, consistent with the type of steel involved, detrimental to fabrication or to performance of parts.

7. **TOLERANCES:** Unless otherwise specified, tolerances shall conform to the following:

7.1 **Bars:** The latest issue of AMS 2231 as applicable. Diameter and thickness tolerances shall be as specified below.

7.1.1 All hexagons, and other bars 2.5 in. and under in diameter or distance between parallel sides - Table I, column headed "0.28 and under."

7.1.2 Bars, other than hexagons, over 2.5 in. in diameter or distance between parallel sides - Table II.

7.2 **Tubing:** The latest issue of AMS 2253 as applicable to cold finished Mechanical Type. Diameter tolerance shall be as specified below:

7.2.1 Tubing 2.5 in. in diameter and under - Table III.

7.2.2 Tubing over 2.5 in. in Diameter - Table V.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition. This report shall include the purchase order number, material specification number, size, and quantity. If forgings are supplied, the part number and size of stock used to make the forgings shall also be included.

8.2 Unless otherwise specified, 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, 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.