

AERONAUTICAL MATERIAL SPECIFICATION

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STEEL

0.55Ni - 0.5Cr - 0.25Mo (0.38-0.43C) (SAE 8740)
Heat Treated (105000TS)

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

2. FORM: Bars and forgings.

3. COMPOSITION:

		Check Analysis	
		Under Min	Over Max
Carbon	0.38 - 0.43	0.02	0.02
Manganese	0.75 - 1.00	0.04	0.04
Silicon	0.20 - 0.35	0.02	0.02
Phosphorus	0.040 max	--	0.005
Sulfur	0.040 max	--	0.005
Chromium	0.40 - 0.60	0.03	0.03
Nickel	0.40 - 0.70	0.03	0.03
Molybdenum	0.20 - 0.30	0.02	0.02

4. CONDITION: Hardened from above the transformation range and tempered.

4.1 Bars: Ground, pickled, blasted, or equivalent and oiled to prevent rusting during shipment.

5. TECHNICAL REQUIREMENTS:

5.1 Bars: 1-3/4 in. and less in nominal diameter or distance between parallel sides.

5.1.1 Tensile Properties: Test specimens shall have their axes located approximately at the center of the bar.

Tensile Strength, psi	105,000 min
Yield Strength at 0.2% Offset or at 0.0097 inch in 2 in. Extension Under Load, psi	85,000 min
Elongation, % in 4D	17 min
Reduction of Area, %	55 min

5.1.2 Hardness: The hardness at the center and on the surface shall be Brinell 223 to 262.

5.2 Forgings: The hardness at the center and on the surface shall be Brinell 223 to 262, unless otherwise specified on the drawing.

5.3 Grain Size: Five or finer, ASTM E19-46, method a. A heat of steel predominantly five or finer with grains as large as three is permissible.

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5.4 Decarburization:

5.4.1 Bars ordered ground, turned, or polished shall be free from decarburization.

5.4.2 Decarburization of bars to which 5.4.1 is not applicable shall be not greater than the following:

Nominal Diameter or Distance Between Parallel Sides Inches	Maximum Depth of Decarburization Inch
0.375 and under	0.010
Over 0.375 to 0.500, incl	0.012
Over 0.500 to 0.625, incl	0.014
Over 0.625 to 1.000, incl	0.017
Over 1.000 to 1.500, incl	0.020
Over 1.500 to 2.000, incl	0.025
Over 2.000 to 2.500, incl	0.030
Over 2.500 to 3.000, incl	0.035

5.4.3 Unless otherwise agreed upon by purchaser and vendor, decarburization shall be measured by the microscopic method, or by Rockwell Superficial 30-N scale hardness method, or equivalent hardness testing method, on hardened specimens. Depth of decarburization, when measured by a hardness method, is defined as the distance measured from the nearest original surface to the point at which no increase in hardness is found.

6. **QUALITY:** Steel shall be aircraft quality. It shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

7. **TOLERANCES:** Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2251 as applicable. Diameter or thickness tolerances for cold finished bars and all hexagons shall conform to Table I, column headed "Over 0.55 and all Carbons Heat Treated".

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 and grain size of each heat in the shipment. This report shall include the purchase order number, heat number, material specification number, size, and quantity from each heat. 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.