AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 6418

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Revised

STEEL
1.8Ni - 1.5Si - 1.3Mn - 0.4Mo (0.23-0.28C)

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

2. FORM: Bars, billets, and forgings.

3. APPLICATION: Primarily for parts requiring high tensile strength and good ductility with relatively high impact strength and hardness.

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.23 - 0.28	0.01	0.01
Manganese	1.20 - 1.50	0.04	0.04
Silicon	1.30 - 1.70	0.05	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.040 max	--	0.005
Nickel	1.65 - 2.00	0.05	0.05
Molybdenum	0.35 - 0.45	0.03	0.03

5. CONDITION:

5.1 Bars: In a machinable condition having hardness not higher than Brinell 241 or equivalent, except that, if ordered cold finished, bars may have hardness as high as Brinell 248 or equivalent.

5.2 Forgings: As ordered.

5.3 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Hardenability: The hardenability shall be J45-24 min when determined by the standard end-quench test specimen in accordance with the SAE Method of Determining Hardenability published in the latest issue of the SAE Handbook, except that the steel shall be normalized at 1700 F ± 10 and the test specimen austenitized at 1575 F ± 10.

6.2 Grain Size: Five or finer, ASTM E19-46, Method a, modified by cooling from the carburizing temperature to 1300 F + 25, and holding for one hour before cooling to room temperature. A heat of steel predominantly five or finer with grains as large as three is permissible.

6.3 Impact Strength (Notch Sensitivity): The Izod impact value shall be not less than 20 ft-lb when tested at room temperature in accordance with ASTM E23-47T using a V-notched specimen. Specimens, before test, shall have hardness not lower than Rockwell C45 after being quenched in oil from 1575 F ± 10 and tempered at 525-550 F. Before heat treatment, specimens shall be to size or approximately to size, except for the notch.

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6.4 Decarburization:

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

6.4.2 Allowable decarburization of bars ordered for redrawing or forging, or to definite microstructural requirements, shall be as agreed upon by purchaser and vendor.

6.4.3 Decarburization of bars to which 6.4.1 or 6.4.2 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
Over 3.000	0.040

6.4.4 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 is defined as the distance measured from the nearest original surface to the point at which no increase in hardness is found.

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

8. 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 "Mean of Carbon 0.45% and less."

9. REPORTS:

9.1 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, hardenability, grain size, and impact value 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.

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