AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 6442 A

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STEEL
0.5Cr (0.95-1.10C) (SAE 50100)

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, and forgings.

3. APPLICATION: Parts of small cross section, such as needle bearings, which require a through-hardening steel usually with hardness of approximately Rockwell C60.

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.95 - 1.10	0.03	0.03
Manganese	0.25 - 0.45	0.03	0.03
Silicon	0.20 - 0.35	0.02	0.02
Phosphorus	0.025 max	--	0.005
Sulfur	0.025 max	--	0.005
Chromium	0.40 - 0.60	0.03	0.03

5. CONDITION:

5.1 Bars: Unless otherwise specified, bars shall be supplied in a machinable condition, with microstructure of spheroidized cementite in ferrite matrix, and having hardness not higher than Brinell 207, except that if cold finished stock is ordered, hardness as high as Brinell 248 is permissible.

5.2 Forgings: As ordered.

5.3 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENT:

6.1 Decarburization:

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

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

6.1.3 Decarburization of bars to which 6.1.1 or 6.1.2 is not applicable shall be not greater than the following:

6.1.3 (Cont'd.)

Nominal Diameter or Distance Between Parallel Sides Inches	Maximum Depth of Decarburization Inch
0.50 and under	0.015
Over 0.50 to 1.00, incl	0.020
Over 1.00 to 1.50, incl	0.025
Over 1.50 to 2.00, incl	0.030
Over 2.00 to 2.50, incl	0.035
Over 2.50 to 3.00, incl	0.040

6.1.4 Unless otherwise agreed upon by purchaser and vendor, decarburization shall be measured by Rockwell Superficial 30N 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 bearing 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.

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 "Over 0.48 and all Carbons Heat Treated or Strain Relieved".

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 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.

9.2 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.

10. IDENTIFICATION:

10.1 Bars: Individual pieces or bundles shall have attached a metal tag stamped with the purchase order number, AMS 6442A, nominal size, and heat number, or shall be boxed and the box marked with the same information. In addition to the above identification, flats 2 in. and larger in both dimensions and other bars 2 in. and over in diameter or distance between parallel sides shall be stamped with the heat number within 2 in. of one end.