

AERONAUTICAL MATERIAL SPECIFICATIONS

AMS 5632B

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

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STEEL, CORROSION RESISTANT
17Cr - 0.5Mo (0.95 - 1.20C) (SAE 5144OF)
Free-Machining

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **FORM:** Bars, forgings, and forging stock.
3. **APPLICATION:** Primarily for parts requiring resistance to both corrosion and wear with hardness as high as Rockwell C 58, where the amount of machining warrants use of a free machining steel.

4. **COMPOSITION:**

	Type 1	Type 2	Check Analysis	
			Under Min	or Over Max
Carbon	0.95 - 1.20	0.95 - 1.20	0.03	0.03
Manganese	1.25 max	1.25 max	--	0.04
Silicon	1.00 max	1.00 max	--	0.05
Phosphorus	0.040 max	0.040 max	--	0.005
Sulfur	0.05 - 0.15	0.030 max	See Note 2	
Chromium	16.00 - 18.00	16.00 - 18.00	0.20	0.20
Nickel	0.75 max	0.75 max	--	0.03
Selenium	- -	0.10 - 0.20	0.03	0.03
Molybdenum	0.40 - 0.60	0.40 - 0.60	0.03	0.03
Copper	0.50 max	0.50 max	--	0.03

Note 1. Unless otherwise specified, either Type 1 or Type 2 may be supplied.

Note 2. Check analysis for sulfur shall be 0.01 under min or over max for Type 1, and 0.005 over max for Type 2.

5. **CONDITION:**

- 5.1 **Bars:** In a machinable condition, having hardness not higher than Brinell 286 or equivalent. All hexagons and other bars 2.75 in. and less in diameter or distance between parallel sides shall be cold finished.
- 5.2 **Forgings:** As ordered.
- 5.3 **Forging Stock:** As ordered by the forging manufacturer.

6. **TECHNICAL REQUIREMENTS:**

- 6.1 **Hardenability:** Material shall be capable of meeting the following test:
 - 6.1.1 Specimens with sections 0.375 in. in thickness, cut from a bar or forging, shall be placed in a furnace which is at 1875 F \pm 10, allowed to heat to 1875 F \pm 10, held at heat 25 min., and cooled in still air. Hardness of such specimens shall be not lower than Rockwell C 58.

Section 7C of the SAE Technical Board rules provides that: "All technical reports including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no obligation to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

6.2 Decarburization:

- 6.2.1 Bars ordered ground, turned, or polished shall be free from decarburization.
- 6.2.2 Allowable decarburization of bars ordered for redrawing or forging, or to specified microstructural requirements, shall be as agreed upon by purchaser and vendor.
- 6.2.3 Decarburization of bars to which 6.2.1 or 6.2.2 is not applicable shall be not greater than the following:

Nominal Diameter or Distance Between Parallel Sides Inches	Depth of Decarburization Inch
0.500 and under	0.015
Over 0.500 to 1.000, incl	0.020
Over 1.000 to 1.500, incl	0.025
Over 1.500 to 2.000, incl	0.030
Over 2.000 to 2.500, incl	0.035
Over 2.500 to 3.000, incl	0.040

- 6.2.4 Unless otherwise agreed upon by purchaser and vendor, decarburization shall be measured 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.
- 6.2.4.1 When determining the depth of decarburization, it is permissible to disregard local areas provided the decarburization of such areas does not exceed the limits above by more than 0.005 in. and the width is 0.065 in. or less.

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

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2241 as applicable. Diameter and thickness tolerances shall be as specified below:

- 8.1 All hexagons, and other bars 2.75 in. and less in diameter or distance between parallel sides, Table I.
- 8.2 Bars, other than hexagons, over 2.75 in. in diameter or distance between parallel sides, Table II.

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.