Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AEROSPACE MATERIAL SPECIFICATION

AMS 5632C
Superseding AMS 5632B

Issued 6-1-42
Revised 11-1-69

STEEL BARS AND FORGINGS, CORROSION RESISTANT
17Cr - 0.5Mo (0.95 - 1.20C) (SAE 51440F)
Free-Machining

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

Ø 2. FORM: Bars, wire, 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	
	min	max	min	max
Carbon	0.95 -	1.20	0.95 -	1.20
Manganese	--	1.25	--	1.25
Silicon	--	1.00	--	1.00
Phosphorus	--	0.040	--	0.040
Sulfur	0.10 -	0.35	--	0.030
Chromium	16.00 -	18.00	16.00 -	18.00
Molybdenum	0.40 -	0.60	0.40 -	0.60
Selenium	--	--	0.10 -	0.20
Nickel	--	0.75	--	0.75
Nitrogen (2)	--	0.08	--	0.08
Copper	--	0.50	--	0.50
Tin	--	0.05	--	0.05

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

Note 2. Determination not required for routine acceptance.

4.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248.

5. CONDITION: Unless otherwise ordered, the product shall be supplied in the following condition:

5.1 Bars: Annealed, 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.

Ø 5.2 Wire: Annealed and cold finished having tensile strength not higher than 140,000 psi.

5.3 Forgings: As ordered.

5.4 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 ± 10 (1023.9 C ± 5.6), allowed to heat to 1875 F ± 10 (1023.9 C ± 5.6) held at heat for 25 min., and cooled in still air. Hardness of such specimens shall be not lower than Rockwell C 58.

6.2 Decarburization:

6.2.1 Bars ordered ground, turned, or polished shall be free from decarburization on the ground, turned, or polished surfaces.

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 5.2.1 or 5.2.2 is not applicable shall be not greater than the following:

Nominal Diameter or Distance Between Parallel Sides Inches	Depth of Decarburization Inch
Up to 0.500, incl	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

6.2.3.1 Limits for depth of decarburization of bars over 3.000 in. in nominal diameter or distance between Ø parallel sides shall be as agreed upon by purchaser and vendor.

6.2.4 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 but untempered specimens protected during heat treatment to prevent changes Ø in the surface carbon content. Depth of decarburization, when measured by a hardness method, is defined as the perpendicular distance from the surface to the depth under that surface below which there is no further increase in hardness. Such measurements shall be far enough away from any adjacent surface to be uninfluenced by any decarburization or lack of decarburization thereon.

6.2.4.1 When determining the depth of decarburization, it is permissible to disregard local areas provided Ø 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 for bars and wire shall conform to all applicable Ø requirements of the latest issue of AMS 2241. For sizes not covered by AMS 2241, tolerances shall be as agreed upon by purchaser and vendor.