AEROSPACE
MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York, N.Y. 10017

AMS 6407B
Supersedes AMS 6407A
Issued 3-1-55
Revised 9-30-66

STEEL BARS, FORGINGS, AND TUBING
1.2Cr - 2.05Ni - 0.45Mo (0.27 - 0.33C)

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, mechanical tubing, and forging stock.

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

4. COMPOSITION:

	min	max
Carbon	0.27	0.33
Manganese	0.60	0.80
Silicon	0.40	0.70
Phosphorus	--	0.025
ø Sulfur	--	0.025
Chromium	1.00	1.35
Nickel	1.85	2.25
Molybdenum	0.35	0.55
Copper	--	0.35

4.1 Check Analysis: Composition variations shall conform to the requirements of the latest issue of AMS 2259, paragraph titled "Low Alloy Steels".

5. CONDITION:

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

5.2 Forgings: As ordered.

5.3 Mechanical Tubing: In a machinable condition and cold finished, having hardness not higher than ø Rockwell C 25, or equivalent, except that tubing ordered hot finished shall be furnished in a machinable condition having hardness not higher than Rockwell B 99, or equivalent.

5.4 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS: When ASTM methods are specified for determining conformance to ø the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

6.1 Hardenability: The hardenability shall be J48=4 min and J47=20 min when determined by the standard end-quench test specimen in accordance with the SAE Method of Determining Hardenability published ø in the latest issue of the SAE Handbook, except that the steel shall be normalized at 1700 F ± 10 (926.7 C ± 5.6) and the test specimen austenitized at 1600 F ± 10 (871.1 C ± 5.6). The hardenability test is not required on a product which will not yield a suitable specimen but the steel from which the product is made shall conform to the hardenability specified.

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6.2 Grain Size: Predominantly 5 or finer with occasional grains as large as 3 permissible, ASTM E112, Ø McQuaid-Ehn Test.

6.3 Impact Strength: The Izod impact value shall be not less than 15 ft-lb when tested at room temperature in accordance with ASTM E23 using a V-notched specimen. Specimens, before test, shall have hardness Ø not lower than Rockwell C 46 after being quenched in oil from 1600 F ± 10 (871.1 C ± 5.6) and tempered at not lower than 400 F (204 C). Before heat treatment, specimens shall be to size or approximately to size, except for the notch. Specimens shall be longitudinal and taken from sections rolled or forged from full cross section to not over 2 in. round or square.

6.4 Decarburization:

6.4.1 Bars and mechanical tubing ordered ground, turned, or polished shall be free from decarburization on the ground, turned, or polished surfaces. Inside decarburization on such tubing shall not exceed the maximum depth specified in 6.4.4.

6.4.2 Allowable decarburization of bars, billets, and tubing ordered for redrawing or forging or to specified 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	Depth of Decarburization Inch
Up to 0.375, incl	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 Decarburization of all tubing to which 6.4.1 or 6.4.2 is not applicable shall be not greater than the following:

Nominal Wall Thickness Inches	Depth of Decarburization, Inch	
	Inside	Outside
Up to 0.109, incl	0.008	0.015
Over 0.109 to 0.203, incl	0.010	0.020
Over 0.203 to 0.400, incl	0.012	0.025
Over 0.400 to 0.600, incl	0.015	0.030
Over 0.600 to 1.000, incl	0.017	0.035
Over 1.000	0.020	0.040

6.4.5 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 in Ø surface carbon content. Depth of decarburization, when measured by a hardness method, is defined as the perpendicular distance from the surface to the nondecarburized depth under that surface below which there is no further increase in hardness. Measurements shall be far enough away from any adjacent surface to be uninfluenced by any decarburization or lack of decarburization thereon.