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

AEROSPACE MATERIAL SPECIFICATION

AMS 5613K
Superseding AMS 5613J

Issued 3-1-48
Revised 11-1-69

STEEL BARS, FORGINGS, TUBING, AND RINGS, CORROSION AND MODERATE HEAT RESISTANT 12.5Cr (SAE 51410)

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

2. FORM: Bars, wire, forgings, mechanical tubing, flash welded rings, and stock for forging, flash welded rings, or heading.

3. APPLICATION: Primarily for parts and assemblies, such as compressor wheels and blades, requiring oxidation resistance up to 1000 F (538 C), but useful at the higher temperatures only when stresses are low.

4. COMPOSITION:

	min	max
Carbon	--	0.15
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	11.50	13.50
Nickel	--	0.75
Molybdenum	--	0.50
Aluminum	--	0.05
Nitrogen (1)	--	0.08
Copper	--	0.50
Tin	--	0.05

(1) 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: All hexagons and other bars 2.75 in. and under in diameter or distance between parallel sides shall be cold finished. All bars shall be annealed, in a machinable condition, having hardness not higher than Brinell 241 or equivalent.

5.2 Wire: Wire shall be annealed and cold finished with a tensile strength not higher than 115,000 psi.

5.3 Mechanical Tubing: Cold finished, having hardness not higher than Brinell 241 or equivalent.

5.4 Forgings: As ordered.

5.5 Flash Welded Rings: Annealed, having hardness not higher than Brinell 241 or equivalent.

5.5.1 Flash welded rings shall not be supplied unless specified on purchaser's part drawing. When supplied, they shall be manufactured in accordance with the latest issue of AMS 7493, unless otherwise specified.

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5.6 Stock for Forging, Flash Welded Rings or Heading: As ordered by the forging or flash welded ring manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Hardenability: Material 0.375 in. and less in thickness and 0.375 in. thick specimens cut from larger bars, wire, tubes, forgings, and flash welded rings shall conform to the following requirements:

6.1.1 Specimens placed in a furnace which is at 1750 F ± 10 (954.4 C ± 5.6), allowed to heat to 1750 F ± 10 (954.4 C ± 5.6), held at heat for 30 min., and cooled in still air shall have hardness of Rockwell C 35 - 45 or equivalent, except that tubing shall have hardness of Rockwell C 35 - 50 or equivalent.

7. QUALITY: When specified, material shall conform to the latest issue of AMS 2303. The product shall be Ø uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of the following:

8.1 Bars and Wire: The latest issue of AMS 2241.

8.2 Tubing: The latest issue of AMS 2243.

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, AMS 2303 frequency-severity rating when specified, and hardenability of each heat in the shipment. This report shall include the purchase order number, heat number, material specification number and its revision letter, 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 and its revision letter, 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: Unless otherwise specified, the product shall be identified as follows:

10.1 Bars, Wire, and Tubing:

10.1.1 Each straight bar, wire, and tube 0.500 in. and over in OD or least width of flat surface shall be marked in a row of characters recurring at intervals not greater than 3 ft with AMS 5613K, heat number, and manufacturer's identification. The characters shall be of such size as to be clearly legible, shall be applied using a suitable marking fluid, shall be capable of being removed in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the material or its performance and shall be sufficiently stable to withstand normal handling.

10.1.2 Straight wire and tubes less than 0.500 in. in OD or least width of flat surface shall be securely bundled and identified by a metal or plastic tag embossed with the purchase order number, AMS 5613K, heat number, nominal size, and manufacturer's identification and attached to each bundle or shall be boxed and the box marked with the same information.

10.1.3 Coiled bars and wire shall be securely bundled and identified by a metal or plastic tag embossed with the purchase order number, AMS 5613K, heat number, nominal size, and manufacturer's identification and attached to each coil or shall be boxed and the box marked with the same information.

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