

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS5613B

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STEEL, CORROSION AND MODERATE HEAT RESISTANT 12.5Cr (SAE 51410)

- 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, forgings, and mechanical tubing.
- 3. APPLICATION:** Primarily for parts and assemblies, such as compressor wheels and blades, requiring oxidation resistance up to 1000 F, but useful at the higher temperatures only when stresses are low.
- 4. COMPOSITION:**

		Check Analysis	
		Under Min	or Over Max
Carbon	0.15 max	--	0.01
Manganese	1.00 max	--	0.03
Silicon	1.00 max	--	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	11.50 - 13.50	0.15	0.15
Nickel	0.75 max	--	0.03
Molybdenum	0.50 max	--	0.03
Copper	0.50 max	--	0.03
Tin	0.05 max		
Aluminum	0.05 max		

5. CONDITION:

- 5.1 Bars:** All hexagons, and other bars 2.75 in. and less in diameter or distance between parallel sides shall be cold finished. All bars shall have hardness not higher than Brinell 241 or equivalent.
- 5.2 Tubing:** Cold finished and having hardness not higher than Brinell 241 or equivalent.
- 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** 3/8 in. thick, cut from a bar, tube or forging, shall be heated to 1750 F \pm 10, held for 30 minutes and cooled in still air. Hardness of such specimens shall be Rockwell C 35-45.

proved and practices recommended, are advisory only. Their SAE standard or recommended practice, and no commitment of 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 infringement of patents.

7. QUALITY: Material 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 following:

8.1 Bars: Shall conform to the latest issue of AMS 2241 as applicable and as specified below:

8.1.1 All hexagons, and other bars 2.75 in. and less in diameter or distance between parallel sides, shall conform to Table I.

8.1.2 Diameter or thickness of bars, other than hexagons, over 2.75 in. in diameter or distance between parallel sides shall conform to Table II.

8.2 Tubing: Shall conform to the latest issue of AMS 2243 as applicable and as specified below:

8.2.1 Diameter shall conform to Table I, columns headed "Annealed or Solution Heat Treated".

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 and hardenability 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 and Tubing: Individual pieces or bundles shall have attached a metal tag stamped with the purchase order number, AMS 5613B, 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 x 1 in. and larger and other bars 1 in. and over in diameter or distance between parallel sides shall be stamped with the heat number within 2 in. of one end.

10.2 Forgings: Shall be identified in accordance with the latest issue of AMS 2808.

11. REJECTIONS: Material not conforming to this specification or to authorized modifications will be subject to rejections.