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

AMS 5613E

Issued 3-1-48
Revised 7-15-61

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, forgings, forging stock, 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:

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

Note. Routine determinations of nitrogen are not required.

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

5. CONDITION:

5.1 Bars: Unless otherwise specified, all hexagons, and other bars 2.75 in. and under in diameter or distance between parallel sides shall be cold finished.
ø Bars, other than hexagons, over 2.75 in. in diameter or distance between parallel sides shall be hot finished. All bars shall have hardness not higher than Brinell 241 or equivalent.

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

5.3 Forgings: As ordered.

5.4 Forging Stock: As ordered by the forging manufacturer.

Printed in U. S. A.

6. TECHNICAL REQUIREMENTS:

6.1 Hardenability: Material 0.375 in. and less in thickness and 0.375 in. thick specimens cut from larger bars, tubes, and forgings when placed in a furnace which is at 1750 F + 10, allowed to heat to 1750 F + 10, held at heat for 30 min., and cooled in still air shall conform to the following requirements:

6.1.1 Bars, Forgings, and Forging Stock: Hardness shall be Rockwell C 35 - 45 or equivalent.

6.1.2 Tubing: Hardness shall be Rockwell C 35 - 50 or equivalent.

7. QUALITY: Material shall be 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: 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 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 or plastic tag embossed with the purchase order number, AMS 5613E, 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 rejection.