AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5631

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Revised

STEEL, CORROSION RESISTANT
17Cr (0.60-0.75C) (SAE 51440A)

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

2. FORM: Bars, forgings, and forging stock.

3. APPLICATION: Primarily for parts requiring resistance to both corrosion and wear, with hardness as high as Rockwell C 55.

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.60 - 0.75	0.03	0.03
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	16.00 - 18.00	0.20	0.20
Nickel	0.75 max	--	0.03
Molybdenum	0.75 max	--	0.05

5. CONDITION:

5.1 Bars: In a machinable condition, having hardness not higher than Brinell 241 or equivalent. All hexagons, and other bars 2.75 in. and less in diameter or distance between parallel sides shall be cold finished.

5.2 Forgings: As ordered.

5.3 Forging Stock: As ordered by the forging 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 and forgings shall be capable of meeting the following test:

6.1.1 Specimens shall be placed in a furnace which is at 1875 F ± 10, allowed to heat to 1875 F ± 10, held at heat 25 min., and cooled in still air. Hardness of such specimens shall be not lower than Rockwell C 55.

6.2 Decarburization:

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

6.2.2 Allowable decarburization of bars ordered for redrawing or forging, or to specified microstructrual requirements, shall be as agreed upon by purchaser and vendor.

6.2.3 Decarburization of bars to which 6.2.1 or 6.2.2 is not applicable shall be not greater than the following:

Nominal Diameter or Distance Between Parallel Sides Inches	Depth of Decarburization Inch
0.50 and under	0.015
Over 0.50 to 1.00, incl	0.020
Over 1.00 to 1.50, incl	0.025
Over 1.50 to 2.00, incl	0.030
Over 2.00 to 2.50, incl	0.035
Over 2.50 to 3.00, incl	0.040

6.2.4 Unless otherwise agreed upon by purchaser and vendor, decarburization shall be measured by Rockwell Superficial 30-N scale hardness method, or equivalent hardness testing method, on hardened specimens. Depth of decarburization, when measured by a hardness method, is defined as the distance measured from the nearest original surface to the point at which no increase in hardness is found.

6.2.4.1 When determining the depth of decarburization, it is permissible to disregard local areas provided the decarburization of such areas does not exceed the above limits 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, 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 latest issue of AMS 2241 as applicable. Diameter and thickness tolerances shall be as specified below:

8.1 All hexagons, and other bars 2.75 in. and less in diameter or distance between parallel sides - Table I.

8.2 Bars, other than hexagons, over 2.75 in. in diameter or distance between parallel sides - Table II.

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 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.