AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 6274 D

Issued 9-1-42
Revised 11-1-46

STEEL BARS AND FORGINGS
.55Ni - .5Cr - .2Mo (.18 - .23C)

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: Carburized parts which require high minimum core hardness in sections 3/8 in. and less in thickness with wide range allowable and in which the core is not always machinable after hardening.

4. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.18 - 0.23	0.01	0.01
Manganese	0.75 - 1.00	0.04	0.04
Phosphorus	0.040 max	----	0.005
Sulfur	0.040 max	----	0.005
Silicon	0.20 - 0.35	0.02	0.02
Nickel	0.40 - 0.70	0.03	0.03
Chromium	0.40 - 0.60	0.03	0.03
Molybdenum	0.15 - 0.25	0.02	0.02

5. CONDITION: (a) Unless otherwise ordered, bars and tubing shall be supplied in a machinable condition with hardness not higher than Brinell 229.

(b) Stock ordered for forging shall be supplied as ordered by the forging manufacturer.

(c) Forgings shall be supplied as ordered.

6. HARDENABILITY: The steel shall conform to the hardenability of paragraph (a) below unless the purchaser stipulates that the hardness of paragraph (b) below shall apply:

(a) The hardenability shall be J48 max and J29=4 min when determined by the standard end-quench test specimen in accordance with the SAE Method of Determining Hardenability published in the latest issue of the SAE Handbook, except that the steel shall be normalized at 1700 F ± 10 and the test specimen austenitized at 1550 F ± 10. 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 in this paragraph.

(b) Specimens with sections 1/8 in. and 3/8 in. in thickness and not greater than 2 sq in. in area shall be cut from the bar or forging after normalizing at 1700 F ± 10. The specimens shall be ground and then protected by suitable means, or treated in an atmosphere, to minimize scaling and eliminate either carburization or decarburization during heat treatment. The specimens shall be placed in a furnace which is at 1500 F ± 10, allowed to heat to 1500 F ± 10, held 25 minutes and quenched in commercial paraffin oil (100 SUS at 100 F) at room temperature. Each specimen when tested shall have an average hardness of Rockwell C32-47.

7. GRAIN SIZE: Five or finer, ASTM E19-39T, method a, unless otherwise specified. A heat of steel predominantly five or finer with grains as large as three is permissible.

8. QUALITY: (a) Steel shall be aircraft quality. It shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts. Steel in which defects are revealed during fabrication will be subject to rejection.

(b) Steel and parts shall be subject to inspection by any method which will reveal defects.

9. TOLERANCES: Unless otherwise specified, tolerances for bars shall conform to the latest issue of AMS 2251 as applicable and as specified below and for tubing to the latest issue of AMS 2253 as applicable to Mechanical Type:

(a) Diameter or thickness tolerances for cold-finished bars and all hexagons shall conform to AMS 2251, Table I, column headed "Mean of Carbon 0.45% and less".

10. REPORTS: (a) Unless otherwise specified, the vendor of the product shall furnish three copies of a notarized report of the results of tests for chemical composition, hardenability, and grain size of each heat in each shipment. This report shall include the purchase order number, heat number, material specification number, size, and quantity in each heat. If forgings are supplied, the part number and size of steel used to make the forgings shall also be included.

(b) Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a notarized report showing the purchase order number, material specification number, contractor or other direct supplier of steel, part number, and quantity. When steel for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of steel to determine conformance to the requirements of this specification, and shall include in the report a certification that the steel conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

11. SHIPMENTS: More than one heat of steel shall not be supplied on a purchase order without permission of purchaser, unless the order is for more than five tons in which case not more than one additional heat shall be supplied for each additional five tons.