

AEROSPACE MATERIAL SPECIFICATION

SAE AMS5657

REV. C

Issued 1960-06
Cancelled 2007-02
Noncurrent 2007-08
Reaf Nonc 2012-10

Superseding AMS5657B

Steel Bars and Forgings, Corrosion and Moderate Heat-Resistant

15Cr - 7.1Ni - 2.5Mo - 1.1Al

(Composition similar to UNS S15700)

RATIONALE

AMS5657C has been reaffirmed to comply with the SAE five-year review policy.

NONCURRENT NOTICE

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of August, 2007. It is recommended, therefore, that this specification not be specified for new designs.

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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 high strength and oxidation resistance up to 700 F, and where such parts may require welding during fabrication.

4. COMPOSITION:

Carbon	0.09 max
Manganese	1.00 max
Silicon	1.00 max
Phosphorus	0.040 max
Sulfur	0.030 max
Chromium	14.00 - 16.00
Nickel	6.50 - 7.75
Molybdenum	2.00 - 3.00
Aluminum	0.75 - 1.50

4.1 Check Analysis:

Unless otherwise specified, composition variations shall meet the requirements of the latest issue of AMS 2248.

5. CONDITION:

5.1 Bars:

Solution heat treated at $1950\text{ F} \pm 25$ and water quenched, having hardness as indicated below when tested midway between center and surface.

5.1.1 Rounds: Ground, turned, or polished, having hardness not higher than Brinell 269 or equivalent.

5.1.2 Hexagons: Cold drawn for size after solution treatment, having hardness not higher than Brinell 321 or equivalent.

5.1.3 Flats: Hot finished, solution heat treated, and descaled, having hardness not higher than Brinell 269 or equivalent.

5.2 Forgings:

Unless otherwise specified, solution treated at $1950\text{ F} \pm 25$ and water quenched, having hardness not higher than Brinell 321 or equivalent.

5.3 Forging Stock:

As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS:

6.1 Properties After Transformation and Precipitation Hardening:

Material shall conform to the following requirements after heating to $1400\text{ F} \pm 25$, holding at heat 90 min., cooling to $55\text{ F} \pm 5$ within 1 hr, holding at this temperature for not less than 30 min., heating to $1050\text{ F} \pm 10$, holding at heat for 90 min., and cooling in air.

6.1.1 Bars:

6.1.1.1 Tensile Properties: Applicable to sizes 6 in. and under in diameter or distance between parallel sides.

Tensile Strength, psi	180,000 min
Yield Strength at 0.2% Offset or at 0.0150 in.	
in 2 in. Extension Under Load ($E = 29,000,000$), psi	160,000 min
Elongation, % in 4D	8 min
Reduction of Area, %	25 min

6.1.1.1.1 Tensile test specimens shall be taken parallel to the direction of rolling and midway between center and surface where size permits.

6.1.1.2 Hardness: Not lower than Brinell 375 or equivalent.

6.1.2 Forgings:

6.1.2.1 Hardness: Not lower than Brinell 375 or equivalent.