



AEROSPACE MATERIAL SPECIFICATION

AMS-S-7108™

REV. B

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Superseding AMS-S-7108A

Steel, Alloy (Manganese-Silicon-Nickel), Bars and Forging Stock
(Aircraft Quality)

RATIONALE

AMS-S-7108 was to be used to cancel MIL-S-7108, but MIL-S-7108 was cancelled directly to AMS6425.

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This document has been taken directly from U.S. Military Specification MIL-S-7108A and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace MIL-S-7108A. Any part numbers established by the original specification remain unchanged.

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Under Department of Defense policies and procedures, any qualification requirements and associated qualified products lists are mandatory for DOD contracts. Any requirement relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this technical report.

1. SCOPE:

1.1 Scope:

This specification covers manganese-silicon-nickel alloy steel bars and forging stock of aircraft quality and suitable for heat treatment to 220,000 psi minimum tensile strength.

1.2 Classification:

Bars shall be furnished in one of the following physical and surface conditions as specified (see 6.3):

- (A) As forged
- (B) As rolled
- (C) Annealed
- (D) Normalized
- (E) Normalized and tempered
- (F) Hardened and tempered

Surface conditions:

- (1) Black, as forged or rolled
- (2) Pickled or blast cleaned
- (3) Rough turned
- (4) Cold finished
- (5) Turned, ground, and polished

2. APPLICABLE DOCUMENTS:

The following publications, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

2.1 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

E23-47T Tentative Methods of Impact Testing of Metallic Materials

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

P-S-661 Solvent; Dry-Cleaning

QQ-M-151 Metals; General Specification for Inspection of

MIL-I-6868 Inspection Process, Magnetic Particle

FED-STD-48 Tolerances for Steel and Iron Wrought Products

MIL-STD-129 Marking for Shipment and Storage

MIL-STD-163 Preparation of Steel Products for Domestic Shipment (Storage) and Overseas Shipment

3. REQUIREMENTS:

3.1 Material:

The steel shall be of aircraft quality, satisfactory for the fabrication of parts which may be subject to magnetic particle inspection by the methods described in Specification MIL-I-6868.

3.1.1 Manufacturing process: The steel shall be manufactured by the open-hearth or electric-furnace process, unless a single process is specified in the contract or purchase order.

3.1.1.1 Sufficient discard shall be taken from each ingot to insure freedom from piping and undue segregation.

3.2 Chemical composition:

The chemical composition shall be as specified in table I.

TABLE I - Chemical Composition ^{1/}

Element	Analysis, percent	Check analysis tolerance ^{2/} , percent
Carbon	0.23 - 0.28	±0.01
Manganese	1.20 - 1.50	±0.04
Phosphorus	<u>3/</u> 0.040 (max)	+0.005
Sulfur	<u>3/</u> 0.040 (max)	+0.005
Silicon	1.30 - 1.70	±0.05
Nickel	1.65 - 2.00	±0.05
Chromium	0.40 (max)	+0.03
Molybdenum	0.35 - 0.45	±0.03

^{1/} For sizes over 200 square inches in cross-sectional area, or 18 inches in width, or 10,000 pounds in weight per piece, the chemical composition shall be negotiated.

^{2/} Individual determinations may vary from the specified range to the extent shown in the check analysis column, except that elements in any heat shall not vary both above and below the specified range. For sizes over 100 square inches in cross-sectional area, the check analysis shall be negotiated.

^{3/} 0.025 (max) when basic electric-furnace steel is specified.

3.3 Hardenability:

End-quench-hardness values for the steel in all specified conditions shall be Rockwell C-47 minimum at 8/16 inch and C-45 minimum at 24/16 inch.

3.4 Grain size:

The austenitic grain size shall be predominately No. 5 or finer with grains as large as No. 3 permissible.

3.5 Macrostructure:

Visual examination of deep acid etched specimens shall show no evidence of pipes, internal cracks, excessive segregation, or other injurious defects.