AEROSPACE MATERIAL SPECIFICATION

AMS5082™	REV. J

Issued 1944-11
Reaffirmed 2007-05
Revised 2023-08

Superseding AMS5082H

Steel Tubing, Seamless
0.31 - 0.38C (SAE 1035)
Stress Relieved
(Composition similar to UNS G10350)

RATIONALE

AMS5082J is the result of a Five-Year Review and update of the specification. The revision prohibits unauthorized exceptions (see 3.3.3 and 8.4), addresses composition reporting (see 3.1.1), and updates the relevant mechanical testing standard (see 3.3.1).

1. SCOPE

1.1 Purpose

This specification covers a carbon steel in the form of seamless tubing up through 1.500 inches (38.10 mm), inclusive, outer diameter.

1.2 Application

This tubing has been used typically for parts requiring moderate strength, but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2253 Tolerances, Carbon and Alloy Steel Tubing

AMS2259 Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels

AMS2370 Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS5082J

AMS2807 Identification, Carbon and Low-Alloy Steels, Corrosion and Heat-Resistant Steels and Alloys Sheet, Strip, Plate, and Aircraft Tubing

AS7766 Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A751 Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

ASTM A370 Mechanical Testing of Steel Products

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Composition shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM A751 or by other analytical methods acceptable to the purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	0.31	0.38
Manganese	0.60	0.90
Silicon	0.10	0.30
Phosphorus	--	0.040
Sulfur	--	0.050

3.1.1 The producer may test for any element not listed in Table 1 and include this analysis in the report of 4.5. Reporting of any element not listed in the composition table is not a basis for rejection unless limits of acceptability are specified by the purchaser.

3.1.2 Check Analysis

Composition variations shall meet the applicable requirements of AMS2259.

3.2 Condition

Cold drawn and stress relieved.

3.3 Properties

3.3.1 Tubing shall conform to the following requirements:

Tensile testing shall be performed in accordance with ASTM A370.

3.3.1.1 Unless otherwise specified, the strain rate shall be set at 0.005 in/in/min (0.005 mm/mm/min) and maintained within a tolerance of ±0.002 in/in/min (±0.002 mm/mm/min) through 0.2% offset yield strain. After the yield strain, the speed of the testing machine shall be set between 0.05 in/in and 0.5 in/in (0.05 mm/mm and 0.5 mm/mm) of the length of the reduced section (or distance between the grips for specimens not having a reduced section) per minute. Alternatively, an extensometer and strain rate indicator may be used to set the strain rate between 0.05 in/in/min and 0.5 in/in/min (0.05 mm/mm/min and 0.5 mm/mm/min).

3.3.2 Tensile Properties

Except as specified in 3.3.1.1, tubing 1.500 inches (38.10 mm) and under in nominal OD with wall thickness of 0.125 inch (3.18 mm) and under shall have properties as shown in Table 2.

Table 2A - Minimum tensile properties, inch/pound units

Property		Value
Tensile Strength		90 ksi
Yield Strength at 0.2% Offset		70 ksi
Elongation in 2 Inches or 4D		
Nominal OD Inches	Wall Thickness Inches	
Up to 0.500, incl	Up to 0.035, incl	8%
Over 0.500 to 1.500, incl	Over 0.035 to 0.125, incl	10%

Table 2B - Minimum tensile properties, SI units

Property		Value
Tensile Strength		621 MPa
Yield Strength at 0.2% Offset		483 MPa
Elongation in 50 mm or 4D		
Nominal OD Millimeters	Wall Thickness Millimeters	
Up to 12.70, incl	Up to 0.89, incl	8%
Over 12.70 to 38.10, incl	Over 0.89 to 3.18, incl	10%

3.3.2.1 When specified, tubing shall be supplied conforming to the tensile properties shown in Table 3.

Table 3 - Minimum tensile properties, if specified

Property	Value
Tensile Strength	105 ksi (724 MPa)
Yield Strength at 0.2% Offset	85 ksi (586 MPa)
Elongation in 50 mm or 4D	8%

3.3.3 Mechanical property requirements for product outside the size range covered by 1.1 shall be agreed upon between the purchaser and producer and reported per 4.4.2.

3.4 Quality

Tubing, as received by the purchaser, shall be uniform in quality and condition and shall have a finish conforming to the best practice for high quality aircraft tubing. It shall be smooth and free from heavy scale or oxide, burrs, seams, tears, grooves, laminations, slivers, pits, and other imperfections detrimental to usage of the tubing. Surface imperfections such as handling marks, straightening marks, light mandrel and die marks, and scale pattern will not be considered injurious if the imperfections are removable within the tolerances specified for wall thickness, but removal of such imperfections is not required.

3.5 Tolerances

Tolerances shall conform to AMS2253.

3.6 Any exceptions shall be authorized by the purchaser and reported as in 4.4.2.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the tubing shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The purchaser reserves the right to sample and perform any confirmatory testing deemed necessary to ensure that the tubing conforms to specified requirements.

4.2 Classification of Tests

All technical requirements of this specification are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Testing

Sampling and testing shall be in accordance with AMS2370.

4.4 Reports

4.4.1 The producer of tubing shall furnish with each shipment a report showing the producer's identity, results of tests for composition of each heat and for tensile properties of each lot, and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS5082J, size, and quantity.

4.4.2 When material produced to this specification is beyond the sizes allowed in the scope, or when exceptions authorized by purchaser are taken to the technical requirements listed in Section 3, the report shall contain a statement "This material is certified as AMS5082J(EXC) because of the following exceptions:" and the specific exceptions shall be listed (see 5.2).

4.5 Resampling and Retesting

Resampling and retesting hall be in accordance with AMS2370.

5. PREPARATION FOR DELIVERY

5.1 Sizes

Except when exact lengths or multiples of exact lengths are ordered, straight tubing will be acceptable in mill lengths of 6 to 20 feet (1.8 to 6.1 m), but not more than 10% of any shipment shall be supplied in lengths shorter than 10 feet (3 m).

5.2 Identification

Identification shall be in accordance with AMS2807. When technical exceptions are taken (see 4.4.2), the material shall be marked with AMS5082J(EXC).

5.3 Protective Treatment

Tubing shall be protected from corrosion prior to shipment.

5.4 Packaging

Tubing shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the tubing to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A producer shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.