SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS-WW-T-700/3 | REV. A

Issued 2001-07
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Superseding AMS-WW-T-700/3A

Tube, Aluminum Alloy, Drawn, Seamless, 2024

RATIONALE

AMS-WW-T-700/3A 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 September, 2007. It is recommended, therefore, that this specification not be specified for new designs.

"NONCURRENT" refers to those specifications which have previously been widely used and which may be required for production or processing of existing designs in the future. The Aerospace Materials Division, however, does not recommend these specifications for future use in new designs. "NONCURRENT" specifications are available from SAE upon request.

Similar but not necessarily identical products are covered in the following specifications. However, this listing is provided for information only and does not constitute authority to substitute these specifications for the "NONCURRENT" specification.

AMS 4086	Aluminum Alloy, Drawn, Round, Seamless Hydraulic Tubing, 4.4Cu - 1.5Mg - 0.6Mn (2024-T3), Solution Heat Treated, Cold Worked and Naturally Aged
AMS 4087	Aluminum Alloy, Tubing, Seamless, Drawn (2024-0), Annealed
AMS 4088	Aluminum Alloy, Drawn, Seamless, Tubing, 4.4Cu - 1.5Mg - 0.60Mn (2024-T3) Solution Heat Treated and Cold Worked
ASTM B 210	Aluminum and Aluminum-Alloy Drawn Seamless Tubes – designating alloy 2024 and applicable temper

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SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMSWWT700/3A

NOTICE

This document has been taken directly from U.S. Military Specification WW-T-700/3F, Amendment 1, 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 WW-T-700/3F, Amendment 1. Any part numbers established by the original specification remain unchanged.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, and (b) the use of the existing government specification or standard format.

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 SAE technical document.

The complete requirements for procuring seamless tube drawn from aluminum alloy 2024 described herein shall consist of this document and the latest issue of WW-T-700/GEN (see 2.1).

1. SCOPE AND CLASSIFICATION:

1.1 Scope:

This specification covers the specific requirements for seamless tube drawn from aluminum alloy 2024.

1.2 Classification:

1.2.1 Tempers: The drawn seamless tube shall be of the following tempers: 0, T3, T42, T81, and F, as specified (see 6.2 and 6.3). The definition of these tempers shall be as specified in WW-T-700/GEN.

1.2.2 Types: The tube shall be of the following types:

Type		Appearance
I	-	Round
II	-	Rectangular and square
III	-	Streamline
IV	-	Oval
V	-	Odd shapes

2. APPLICABLE DOCUMENTS:

The issues of the following documents in effect on date of invitation for bids or solicitation for offers, form a part of this specification to the extent specified herein.

2.1 U.S. Government Publications:

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

WW-T-700/GEN Tube, Aluminum and Aluminum Alloy, Drawn, Seamless, General Specification for

(Activities outside the Federal Government may obtain copies of Federal specifications, standards, and commercial item descriptions, as outlined under General Information in the Index of Federal Specifications, Standards and Commercial Item Descriptions. The Index, which includes cumulative bimonthly supplements as issued, is for sale on a subscription basis by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

2.1 (Continued):

(Single copies of this specification and other Federal specifications and commercial item descriptions required by activities outside the Federal Government for bidding purposes are available without charge from the General Services Administration Business Service Centers in Boston, MA; New York, NY; Philadelphia, PA; Washington, DC; Atlanta, GA; Chicago, IL; Kansas City, MO; Fort Worth, TX; Houston, TX; Denver, CO; San Francisco, CA; Los Angeles, CA; and Seattle, WA.

(Federal Government activities may obtain copies of Federal standardization documents and the Index of Federal Specifications, Standards, and Commercial Item Descriptions from established distribution points in their agencies.)

3. REQUIREMENTS:

3.1 Chemical composition:

The chemical composition shall conform to the requirements specified in Table I.

TABLE I. Chemical composition 1/

Element	Percent	
	Minimum	Maximum
Silicon	-	0.50
Iron	-	0.50
Copper	3.8	4.9
Manganese	0.30	0.9
Magnesium	1.2	1.8
Chromium	-	0.10
Zinc	-	0.25
Titanium	-	0.15
Other elements, each	-	0.05
Other elements, total 2/	-	0.15
Aluminum	Remainder	

1/ Except for "Aluminum" and "Others", analysis normally is made for elements for which specific limits are shown

2/ The sum of those "Others" metallic elements 0.010 percent or more each, expressed to the second decimal before determining the sum

3.2 Mechanical properties:

3.2.1 Tensile strength, yield strength and elongation: The tensile strength, yield strength and elongation mechanical properties parallel to the direction of drawing shall conform to the requirements specified in table II.

TABLE II. Tensile strength, yield strength and elongation properties

Temper	Wall thickness, inch	Tensile strength, minimum, ksi	Yield strength		Percent elongation in 2 inches or 4D 1/, minimum, kind of specimen	
			At 0.2 percent, offset, minimum, ksi	At extension under load, inch per inch	Full section	Cut-out
0	0.018 to 0.500, incl	32.0 2/	15.0 2/	0.0034	-	-
T3	0.018 to 0.024, incl.	64.0	42.0	0.0060	10	-
	0.025 to 0.049, incl.	64.0	42.0	0.0060	12	10
	0.050 to 0.259, incl.	64.0	42.0	0.0060	14	10
	0.260 to 0.500, incl.	64.0	42.0	0.0060	16	12
T42 3/	0.018 to 0.024, incl.	62.0	38.0	0.0058	10	-
	0.025 to 0.049, incl.	62.0	38.0	0.0058	12	10
	0.050 to 0.259, incl.	62.0	38.0	0.0058	14	10
	0.260 to 0.500, incl.	62.0	38.0	0.0058	16	12
T81	0.010 to 0.024, incl.	66.0	58.0	0.0063	-	-
	0.025 to 0.049, incl.	66.0	58.0	0.0063	5	4
	0.050 to 0.249, incl.	66.0	58.0	0.0063	6	5
F	All	4/	4/	4/	4/	4/

1/ Round tube 2 inches or less in outside diameter and square tube 1-1/2 inches or less on a side shall be tested in full section unless the limitations of the testing machine preclude the use of such a specimen. For round tube over 2 inches in diameter, for square tube over 1-1/2 inches on a side, for all sizes of tube other than round or square, or in those cases when a full section specimen cannot be used, a cut-out specimen shall be used. D represents diameter of cut-out specimen

2/ Maximum

3/ Material in the T42 temper is not available from the materials producers

4/ No requirements

3.2.2 Flattening: When specified (see 6.2), round tube (type I) in 0 and T3 tempers shall withstand, without cracking, the flattening test or the alternative bend test specified in WW-T-700/GEN. The values for flattening factor "F" are specified in table III.

TABLE III. Flattening factor

Temper	Wall thickness, inch	F
0	Up through 0.049	3
	0.050 and over	4
T3	All	8

3.2.3 Alternative bend test: The values for the alternative bending factor "N" are specified in table IV.