

WW-T-700/7B
29 December 1983
SUPERSEDING
WW-T-700/7A
July 27, 1972

FEDERAL SPECIFICATION SHEET

TUBE, ALUMINUM ALLOY, DRAWN, SEAMLESS, 7075

This specification was approved by the Assistant Administrator, Office of Federal Supply and Services, General Services Administration, for the use of all Federal Agencies.

The complete requirements for procuring seamless tube drawn from aluminum alloy 7075, 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 7075.

1.2 Classification.

1.2.1 Tempers. The drawn seamless tube shall be of the following tempers: O, T6, T62, T73, or 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:

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

2. APPLICABLE DOCUMENTS

2.1 Government publications. 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.

Federal Specification

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

FSC 4710

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(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.

(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	-	0.40
Iron	-	0.50
Copper	1.2	2.0
Manganese	-	0.30
Magnesium	2.1	2.9
Chromium	0.18	0.28
Zinc	5.1	6.1
Titanium	-	0.20
Others, each	-	0.05
Others, total	-	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

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3.2 Mechanical properties.

3.2.1 Tensile strength, yield strength and elongation properties. 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 per- cent, offset, minimum, ksi	At extens- ion under load, inch per inch	Full section	Cut-out
O	0.025 to 0.049, incl.	40.0 ^{2/}	21.0 ^{2/ 3/}	0.0040	10	8
	0.050 to 0.500, incl.	40.0 ^{2/}	21.0 ^{2/ 3/}	0.0040	12	10
T6 and T62 ^{4/}	0.025 to 0.259, incl.	77.0	66.0	0.0084	8	7
	0.260 to 0.500, incl.	77.0	66.0	0.0084	9	8
T73	0.025 to 0.259, incl.	66.0	56.0	-	10	8
	0.260 to 0.500, incl.	66.0	56.0	-	12	10
F	0.025 to 0.500, incl.	5/	5/	5/	5/	5/

^{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 the 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 the diameter of the cut-out.

^{2/} Maximum

^{3/} Applies only to round tube (type I)

^{4/} Tube in the T62 temper is not available from the materials producers

^{5/} No requirements

3.2.2 Flattening. When specified (see 6.2), round tube (type I) in O and T6 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.

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TABLE III. Flattening factor

Temper	Wall thickness, inch	F
O	Up through 0.049, incl.	4
	0.050 thru 0.259, incl.	5
T6	0.025 thru 0.259, incl.	10

3.2.2.1 Alternative bending factor "N". The values for the alternative bending factor "N" are specified in table IV.

TABLE IV. Bending factor

Temper	Wall thickness, inch	N
O	Up thru 0.125, incl.	4
	Over 0.125 thru 0.259, incl	6
T6	Up thru 0.062, incl.	8
	Over 0.062 thru 0.125, incl.	10
	Over 0.125 thru 0.259, incl.	11

3.2.3 Leak test. When specified (see 6.2), round tube (type I) shall withstand either the pressure test or the electromagnetic (eddy current) test specified in WW-T-700/GEN.

3.2.4 Mechanical properties after heat treatment. In addition to conforming to the requirements of 3.2.1, material in the tempers identified in the following paragraphs shall, after having been processed to tempers also specified therein, have properties conforming to those specified in Table II, as applicable.

3.2.4.1 Material in the O and F tempers. Material in the O and F tempers, without the subsequent imposition of cold work or forming operations, shall, after proper solution heat treatment and artificial aging, develop the properties specified for the T62 temper.

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3.2.4.2 Material in the T6 temper. Material in the T6 temper, without the subsequent imposition of cold work or forming operations, shall be reheat treatable to the properties specified for the T62 temper. Such capability shall be demonstrated when specified (see 6.2 and 6.3).

3.2.4.3 Material in the O temper. Material in the O temper, without the subsequent imposition of cold work or forming operations, shall be heat treatable to the properties specified for the T73 temper. Such capability shall be demonstrated when specified (see 6.2 and 6.3).

3.3 Electrical conductivity acceptance criteria. Each lot of 7075-T73 tube shall be eddy-current tested by testing the previously selected tensile test sample to the following criteria:

- (a) Determine electrical conductivity and tensile properties
- (b) If the conductivity is below 38.0 percent International Annealed Copper Standard (IACS), the tube is considered unsatisfactory and must be reprocessed, regardless of property level
- (c) If the conductivity is 40.0 percent IACS or higher and tensile properties meet the minimum values specified herein, the tube is considered to be satisfactory
- (d) If conductivity is 38.0 through 39.9 percent IACS, if tensile properties meet the minimum limits specified herein, and if the yield strength does not exceed the specified minimum by more than 11.9 ksi, the tube is considered to be satisfactory
- (e) If conductivity is 38.0 through 39.9 percent IACS and the yield strength exceeds the specified minimum value by 12.0 ksi or more, the tube is considered suspect. When tube is considered suspect, it shall be reprocessed

3.4 Marking. In addition to the marking required by WW-T-700/GEN, tube in the T6 and T73 tempers shall be identified by lot number marked in at least one location on each piece.

4. QUALITY ASSURANCE PROVISIONS (see WW-T-700/GEN)

4.1 Heat treatment.

4.1.1 Sampling for heat treatability. From material in each temper of those specified for heat treatability demonstrations in 3.2.4 and 6.2, an additional number of specimens equal to that required by WW-T-700/GEN shall be taken and tested after heat treatment to each temper specified, as applicable, to determine conformance to 3.2.4.

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5. PREPARATION FOR DELIVERY (see WW-T-700/GEN)

6. NOTES

6.1 Intended use. This tube is intended for use when high strength is required, but reduced weldability or reduced corrosion resistance can be tolerated. This tubing is not applicable for use in transferring hydraulic/pneumatic mediums.

6.2 Ordering data. Purchasers should select the preferred options permitted herein, and include the following information in procurement documents:

- (a) Title, number and date of this specification
- (b) Temper of material required (see 1.2.1)
- (c) Type of tube required (see 1.2.2)
- (d) Whether round tube (type I) should withstand flattening (see 3.2.2)
- (e) Whether round tube (type I) should withstand leak test (see 3.2.3)
- (f) Dimensions required
- (g) Requirements for sizes not specifically covered (see WW-T-700/GEN)
- (h) Whether demonstration of capability to develop properties in tempers other than those supplied is required (see 3.2.4)
- (i) Selection of applicable levels of preservation and packing (see WW-T-700/GEN)

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MILITARY INTEREST:

Custodians

Army-MR
Navy-AS
Air Force-20

Review Activities

Army-AR, ME
Air Force-99
DLA-CS

User Activities

Army-MI
Navy-MC

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA-FSS
COMMERCE-NBS
HEW-FEC
NASA-KSC, MSF
USDA-AFS

PREPARING ACTIVITY:

NAVY-AS
DoD Project 4710-0713

Orders for this publication are to be placed with the General Services Administration, acting as an agent for the Superintendent of Documents. See Section 2 of this specification to obtain extra copies and other documents referenced herein.

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER WW-T-700/78		2. DOCUMENT TITLE TUBE, ALUMINUM ALLOY, DRAWN, SEAMLESS, 7075	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify): _____	
5. PROBLEM AREAS			
a. Paragraph Number and Wording.			
b. Recommended Wording.			
c. Reason/Rationale for Recommendation			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	

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