Designation: B 210M – 00
METRIC

Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes [Metric][1]

This standard is issued under the fixed designation B 210M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope *

1.1 This specification covers aluminum and aluminum-alloy drawn seamless tubes in straight lengths and coils for general purpose and pressure applications in alloys (Note 2), tempers, and thicknesses shown in Table 2. Coiled tubes are generally available only as round tubes with a wall thickness not exceeding 2.00 mm and only in nonheat-treatable alloys.

1.2 Alloy and temper designations are in accordance with ANSI H35.1M. The equivalent Unified Numbering System alloy designations are those of Table 1 preceded by A9, for example, A91100 for aluminum 1100 in accordance with Practice E 527.

1.3 Preferred metric sizes are in accordance with ANSI B32.5.

NOTE 1—See Specification B 483M for aluminum and aluminum-alloy drawn tubes for general purpose applications, Specification B 234M for aluminum-alloy drawn seamless tubes for condensers and heat exchangers, and Specification B 241/B 241M for aluminum-alloy seamless pipe and seamless extruded tube.

NOTE 2—Throughout this specification use of the term *alloy* in the general sense includes aluminum as well as aluminum alloy.

1.4 This specification is the metric counterpart of Specification B 210.

1.5 For acceptance criteria for inclusion of new aluminum and aluminum alloys in this specification, see Annex A2.

2. Referenced Documents

2.1 The following documents of the issue in effect on date of material purchase form a part of this specification to the extent referenced herein:

2.2 *ASTM Standards:*

B 557M Test Methods of Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products [Metric][2]

B 597 Practice for Heat Treatment of Aluminum Alloys[2]

B 660 Practices for Packaging/Packing of Aluminum and Magnesium Products[2]

B 666/B 666M Practice for Identification Marking of Aluminum Products[2]

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications[3]

E 34 Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys[4]

E 55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition[4]

E 215 Practice for Standardizing Equipment for Electromagnetic Examination of Seamless Aluminum-Alloy Tube[5]

E 227 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique[4]

E 527 Practice for Numbering Metals and Alloys (UNS)[6]

E 607 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique, Nitrogen Atmosphere[7]

E 716 Practices for Sampling Aluminum and Aluminum Alloys for Spectrochemical Analysis[7]

E 1004 Test Method for Electromagnetic (Eddy-Current) Measurements of Electrical Conductivity[5]

E 1251 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Argon Atmosphere, Point-to-Plane, Unipolar Self-Initiating Capacitor Discharge[7]

2.3 *ANSI Standards:*

B 32.5 Preferred Metric Sizes For Tubular Metal Products Other Than Pipe[8]

H35.1M Alloy and Temper Designation Systems for Aluminum[2]

H35.2M Dimensional Tolerances for Aluminum Mill Products[2]

2.4 *Military Standard:*

[1] This specification is under the jurisdiction of ASTM Committee B07 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.03 on Aluminum Alloy Wrought Products.

Current edition approved May 10, 2000. Published August 2000. Originally published as B 210M–80. Last previous edition B 210M–95.

[2] *Annual Book of ASTM Standards*, Vol 02.02.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

[4] *Annual Book of ASTM Standards*, Vol 03.05.

[5] *Annual Book of ASTM Standards*, Vol 03.03.

[6] *Annual Book of ASTM Standards*, Vol 01.01.

[7] *Annual Book of ASTM Standards*, Vol 03.06.

[8] Available from American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.

***A Summary of Changes section appears at the end of this standard.**

TABLE 1 Chemical Composition Limits[A,B,C]

Alloy	Silicon	Iron	Copper	Manganese	Magnesium	Chromium	Zinc	Titanium	Other Elements[D]		Aluminum, min
									Each	Total[E]	
1060	0.25	0.35	0.05	0.03	0.03	...	0.05	0.03	0.03[F]	...	99.60 min[G]
1100	0.95 Si + Fe		0.05–0.20	0.05	...	...	0.10	...	0.05	0.15	99.00 min[G]
2011	0.40	0.7	5.0–6.0	...	...	...	0.30	...	0.05[H]	0.15	remainder
2014	0.50–1.2	0.7	3.9–5.0	0.40–1.2	0.20–0.8	0.10	0.25	0.15	0.05	0.15	remainder
2024	0.50	0.50	3.8–4.9	0.30–0.9	1.2–1.8	0.10	0.25	0.15	0.05	0.15	remainder
3003	0.6	0.7	0.05–0.20	1.0–1.5	...	...	0.10	...	0.05	0.15	remainder
Alclad 3003[I]											
3102	0.40	0.7	0.10	0.05–0.40	...	...	0.30	0.10	0.05	0.15	remainder
Alclad 3102[I]											
3303	0.6	0.7	0.05–0.20	1.0–1.5	...	...	0.30	...	0.05	0.15	remainder
Alclad 3303[I]											
5005	0.30	0.7	0.20	0.20	0.50–1.1	0.10	0.25	...	0.05	0.15	remainder
5050	0.40	0.7	0.20	0.10	1.1–1.8	0.10	0.25	...	0.05	0.15	remainder
5052	0.25	0.40	0.10	0.10	2.2–2.8	0.15–0.35	0.10	...	0.05	0.15	remainder
5083	0.40	0.40	0.10	0.40–1.0	4.0–4.9	0.05–0.25	0.25	0.15	0.05	0.15	remainder
5086	0.40	0.50	0.10	0.20–0.7	3.5–4.5	0.05–0.25	0.25	0.15	0.05	0.15	remainder
5154	0.25	0.40	0.10	0.10	3.1–3.9	0.15–0.35	0.20	0.20	0.05	0.15	remainder
5456	0.25	0.40	0.10	0.50–1.0	4.7–5.5	0.05–0.20	0.25	0.20	0.05	0.15	remainder
6061	0.40–0.8	0.7	0.15–0.40	0.15	0.8–1.2	0.04–0.35	0.25	0.15	0.05	0.15	remainder
6063	0.20–0.6	0.35	0.10	0.10	0.45–0.9	0.10	0.10	0.10	0.05	0.15	remainder
6262	0.40–0.8	0.7	0.15–0.40	0.15	0.8–1.2	0.04–0.14	0.25	0.15	0.05[J]	0.15	remainder
7072 cladding[K]	0.7 Si + Fe		0.10	0.10	0.10	...	0.8–1.3	...	0.05	0.15	remainder
7075	0.40	0.50	1.2–2.0	0.30	2.1–2.9	0.18–0.28	5.1–6.1	0.20	0.05	0.15	remainder

[A] Limits are in weight percent maximum unless shown as a range or otherwise stated.
[B] Analysis shall be made for the elements for which limits are shown in this table.
[C] For purposes of determining conformance to these limits, an observed value or a calculated value obtained from analysis shall be rounded to the nearest unit in the last right-hand place of figures used in expressing the specified limit, in accordance with the rounding-off method of Practice E 29.
[D] *Others* includes listed elements for which no specific limit is shown as well as unlisted metallic elements. The producer may analyze samples for trace elements not specified in the specification. However, such analysis is not required and may not cover all metallic *Others* elements. Should any analysis by the producer or the purchaser establish that an *Others* element exceeds the limit of *Each* or that the aggregate of several *Others* elements exceeds the limit of *Total*, the material shall be considered non-conforming.
[E] *Other elements*—Total shall be the sum of unspecified metallic elements 0.010 % or more, rounded to the second decimal before determining the sum.
[F] Vanadium 0.05 % max.
[G] The aluminum content shall be calculated by subtracting from 100.00 % the sum of all metallic elements present in amounts of 0.010 % or more each, rounded to the second decimal before determining the sum.
[H] Bismuth and lead each 0.20 − 0.6 %.
[I] Alloy clad with Alloy 7072.
[J] Bismuth and lead each 0.40–0.7 %.
[K] Composition of cladding alloy as applied during the course of manufacture. The samples from finished tube shall not be required to conform to these limits.

MIL-STD-129 Marking for Shipment and Storage[9]

2.5 *Military Specification:*

MIL-H-6088 Heat Treatment of Aluminum Alloys[9]

2.6 *Federal Standard:*

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)[9]

3. Terminology

3.1 *Definitions:*

3.1.1 *tube*—a hollow wrought product that is long in relation to its cross section, which is round, a regular hexagon, a regular octagon, elliptical, or square or rectangular with sharp or rounded corners, and that has uniform wall thickness except as may be affected by corner radii.

3.1.2 *drawn seamless tube*—a tube produced from hollow extrusion ingot and brought to final dimensions by drawing through a die.

3.1.3 *alclad tube*—a composite tube composed of an aluminum-alloy core having on either the inside or outside surface a metallurgically bonded aluminum or aluminumalloy coating that is anodic to the core, thus electrolytically protecting the core against corrosion.

3.1.4 *producer*—the primary manufacturer of the material.

3.1.5 *supplier*—includes only the category of jobbers and distributors as distinct from producers.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *capable of*—The term *capable of* as used in this specification means that the test need not be performed by the producer of the material. However, should subsequent testing by the purchaser establish that the material does not meet these requirements, the material shall be subject to rejection.

4. Ordering Information

4.1 Orders for material to this specification shall include the following information:

4.1.1 This specification designation (which includes the number, the year, and the revision letter, if applicable),

4.1.2 Quantity in pieces or kilograms,

4.1.3 Alloy (Section 7),

4.1.4 Temper (Section 8),

[9] Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

TABLE 2 Tensile Property Limits[A,B]

Temper	Specified Wall Thickness[C]		Tensile Strength, MPa		Yield Strength[D] (0.2 % offset), MPa		Elongation,[E] min, %		
								Cut-Out Specimen	
	Over	Through	Min	Max	Min	Max	Full-Section Specimen in 50 mm	in 50 mm	in 5 × Diameter (5.65 $\sqrt{A}$)
Aluminum 1060[F]									
O	0.45	12.50	60	95	15	...	...	...	...
H12	0.45	12.50	70	...	30	...	...	...	...
H14	0.45	12.50	85	...	70	...	...	...	...
H18	0.45	12.50	110	...	90	...	...	...	...
H113[G]	0.45	12.50	60	...	15	...	...	...	...
F	All		...	...	...	...	...	...	...
Aluminum 1100[F]									
O	0.45	12.50	75	105	25	...	...	...	...
H12	0.45	12.50	95	...	75	...	...	...	...
H14	0.45	12.50	110	...	95	...	...	...	...
H16	0.45	12.50	130	...	115	...	...	...	...
H18	0.45	12.50	150	...	140	...	...	...	...
H113[G]	0.45	12.50	75	...	25	...	...	...	...
F	All		...	...	...	...	...	...	...
Alloy 2011									
T3	0.45	1.20	325	...	275	...	...	...	...
	1.20	12.50	325	...	275	...	10	8	7
T4511	0.45	1.20	305	...	170	...	...	...	...
	1.20	6.50	305	...	170	...	20	18	16
	6.50	12.50	305	...	170	...	20	20	18
Alloy 2014									
O	0.45	12.50	...	220	...	110	...	...	...
T4, T42[H]	0.45	0.63	370	...	205	...	10	...	...
	0.63	1.20	370	...	205	...	12	10	...
	1.20	6.30	370	...	205	...	14	10	...
	6.30	12.50	370	...	205	...	16	12	10
T6, T62[H]	0.45	0.63	450	...	380	...	7	...	...
	0.63	1.20	450	...	380	...	7	6	...
	1.20	6.30	450	...	380	...	8	7	...
	6.30	12.50	450	...	380	...	9	8	7
Alloy 2024									
O	0.45	12.50	...	220	...	100	...	...	...
T3	0.45	0.63	440	...	290	...	10	...	...
	0.63	1.20	440	...	290	...	12	10	...
	1.20	6.30	440	...	290	...	14	10	...
	6.30	12.50	440	...	290	...	16	12	10
T42[H]	0.45	0.63	440	...	275	...	10	...	...
	0.63	1.20	440	...	275	...	12	10	...
	1.20	6.30	440	...	275	...	14	10	...
	6.30	12.50	440	...	275	...	16	12	10
Alloy 3003[F]									
O	0.25	0.63	95	130	35	...	...	...	...
	0.63	1.20	95	130	35	...	30	20	...
	1.20	6.30	95	130	35	...	35	25	...
	6.30	12.50	95	130	35	...	...	30	27
H12	0.25	0.63	120	...	85	...	...	...	...
	0.63	1.20	120	...	85	...	...	...	...
H14	...	0.63	140	...	115	...	3	...	...
	0.63	1.20	140	...	115	...	5	3	...
	1.20	6.30	140	...	115	...	8	4	...
	6.30	12.50	140	...	115	...	...	...	...
H16	0.25	0.63	165	...	145	...	...	...	...
	0.63	1.20	165	...	145	...	3	2	...
	1.20	6.30	165	...	145	...	5	4	...
	6.30	12.50	165	...	145	...	...	...	...
H18	...	0.63	185	...	165	...	2	...	...
	0.63	1.20	185	...	165	...	3	2	...
	1.20	6.30	185	...	165	...	5	3	...
	6.30	12.50	185	...	165	...	...	...	...
H113[G]	0.25	12.50	95	...	35	...	...	...	...
F	All		...	...	...	...	...	...	...

TABLE 2 *Continued*

Temper	Specified Wall Thickness[C]		Tensile Strength, MPa		Yield Strength[D] (0.2 % offset), MPa		Elongation,[E] min, %		
								Cut-Out Specimen	
	Over	Through	Min	Max	Min	Max	Full-Section Specimen in 50 mm	in 50 mm	in 5 × Diameter (5.65 $\sqrt{A}$)
				Alloy Alclad 3003[F]					
O	0.25	0.63	90	125	30	...	...	...	...
	0.63	1.20	90	125	30	...	30	20	...
	1.20	6.30	90	125	30	...	35	25	...
	6.30	12.50	90	125	30	...	...	30	27
H14	0.25	0.63	135	...	110	...	...	...	...
	0.63	1.20	135	...	110	...	5	...	...
	1.20	6.30	135	...	110	...	8	4	...
	6.30	12.50	135	...	110	...	...	...	...
H18	0.25	12.50	180	...	160	...	...	...	...
H113[G]	1.20	12.50	90	...	30	...	...	...	...
F	All		...	...	...	...	...	...	...
				Alloy 3102[F]					
O	0.45	0.63	75	115	25[D]	...	...	...	...
	0.63	1.20	75	115	25[D]	...	30	20	...
	1.20	1.70	75	115	25[D]	...	35	25	...
				Alloy Alclad 3102[F]					
O	0.45	0.63	70	115	25	...	...	...	...
	0.63	1.20	70	115	25	...	30	20	...
	1.20	1.70	70	115	25	...	35	25	...
				Alloy 3303[F]					
O	0.25	0.63	95	130	35	...	...	...	...
	0.63	1.20	95	130	35	...	30	20	...
	1.20	1.70	95	130	35	...	35	25	...
				Alloy Alclad 3303[D]					
O	0.25	0.63	90	130	30	...	...	...	...
	0.63	1.20	90	130	30	...	30	20	...
	1.20	1.70	90	130	30	...	35	25	...
				Alloy 5005[F]					
O	0.45	12.50	105	145	35	...	...	...	...
F	All		...	...	...	...	...	...	...
				Alloy 5050[F]					
O	0.45	12.50	125	165	40	...	...	...	...
H32	0.45	12.50	150	...	110	...	...	...	...
H34	0.45	12.50	170	...	140	...	...	...	...
H36	0.45	12.50	185	...	150	...	...	...	...
H38	0.45	12.50	200	...	165	...	...	...	...
F	All		...	...	...	...	...	...	...
				Alloy 5052[F]					
O	0.45	11.50	170	240	70	...	...	...	...
H32	0.45	11.50	215	...	160	...	...	...	...
H34	0.45	11.50	235	...	180	...	...	...	...
H36	0.45	11.50	255	...	200	...	...	...	...
H38	0.45	11.50	270	...	215	...	...	...	...
F	All		...	...	...	...	...	...	...
				Alloy 5083[F]					
O	0.45	11.50	270	350	110	...	...	14	12
F	All		...	...	...	...	...	...	...
				Alloy 5086[F]					
O	0.45	11.50	240	315	95	...	...	14	12
H32	0.45	11.50	275	...	195	...	...	...	...
H34	0.45	11.50	300	...	235	...	...	...	...
H36	0.45	11.50	325	...	260	...	...	...	...
F	All		...	...	...	...	...	...	...
				Alloy 5154[F]					
O	0.25	11.50	205	285	75	...	10	10	9
H34	0.25	11.50	270	...	200	...	5	5	4

TABLE 2 *Continued*

Temper	Specified Wall Thickness[C]		Tensile Strength, MPa		Yield Strength[D] (0.2 % offset), MPa		Elongation,[E] min, %		
								Cut-Out Specimen	
	Over	Through	Min	Max	Min	Max	Full-Section Specimen in 50 mm	in 50 mm	in 5 × Diameter (5.65 $\sqrt{A}$)
H38	0.25	11.50	310	...	235	...	...	...	...
F	All		...	...	...	...	...	...	...
				Alloy 5456[F]					
O	0.45	11.50	285	365	130	...	...	14	12
F	All		...	...	...	...	...	...	...
				Alloy 6061					
O	0.45	12.50	...	150	...	95	15	15	13
T4	0.63	1.20	205	...	100	...	16	14	...
	1.20	6.30	205	...	110	...	18	16	...
	6.30	12.50	205	...	110	...	20	18	16
T42[H]	0.63	1.20	205	...	95	...	16	14	...
	1.20	6.30	205	...	95	...	18	16	...
	6.30	12.50	205	...	95	...	20	18	16
T6, T62[H]	0.63	1.20	290	...	240	...	10	8	...
	1.20	6.30	290	...	240	...	12	10	...
	6.30	12.50	290	...	240	...	14	12	10
				Alloy 6063					
O	0.45	12.50	...	130	...	...	...	...	...
T4, T42[H]	0.63	1.20	150	...	70	...	16	14	...
	1.20	6.30	150	...	70	...	18	16	...
	6.30	12.50	150	...	70	...	20	18	16
T6, T62[H]	0.63	1.20	230	...	195	...	12	8	...
	1.20	6.30	230	...	195	...	14	10	...
	6.30	12.50	230	...	195	...	16	12	10
T83	0.63	6.30	230	...	205	...	5	...	...
T831	0.63	6.30	195	...	170	...	5	...	...
T832	0.63	1.20	285	...	250	...	8	5	...
	1.20	6.30	275	...	240	...	8	5	...
				Alloy 6262					
T6, T62[H]	0.63	1.20	290	...	240	...	10	8	...
	1.20	0.63	290	...	240	...	12	10	...
	6.30	12.50	290	...	240	...	14	12	10
T9	0.63	10.00	330	...	305	...	5	4	3
				Alloy 7075					
O	0.63	1.20	...	275	...	145	10	8	...
	1.20	12.50	...	275	...	145	12	10	9
T6, T62[H]	0.63	6.30	530	...	455	...	8	7	...
	6.30	12.50	530	...	455	...	9	8	7
T73[I]	0.63	6.30	455	...	385	...	10	8	...
	6.30	12.50	455	...	385	...	12	10	9

[A] See Annex A1.
[B] To determine conformance to this specification, each value for tensile strength and for yield strength shall be rounded to the nearest 0.1 MPa and each value for elongation to the nearest 0.5 % both in accordance with the rounding method of Practice E 29.
[C] Coiled tube is generally available with a maximum wall thickness of 2.00 mm and only in nonheat-treatable alloys.
[D] Yield strength to be determined only on straight tube.
[E] Elongation in 50 mm apply for tube tested in full-section, for sheet-type specimens, for tubes having a flat wall, and for similar curved specimens for tubes having a curved wall, up to a maximum wall thickness of 12.50 mm. Elongations in 5*D* (5.65 $\sqrt{A}$), where *D* and *A* are diameter and cross-sectional area of the specimens, respectively, apply to round test specimens machined from wall thicknesses over 6.30 mm.
[F] In this alloy tube other than round is produced only in the F (as drawn) and O tempers. Properties for F temper are not specified or guaranteed.
[G] Beginning with the 1982 issue the requirements for the H112 tempers were replaced by the H113 temper, applicable to other than round tube, which is fabricated by cold-forming annealed round tube and acquires some temper in this forming operation.
[H] Material in the T42 or T62 tempers is not available from the material producers.
[I] Material in this temper exhibits improved resistance to stress corrosion compared to that of the T6 temper. The stress corrosion resistance capability of individual lots is determined by testing the previously selected tension-test samples in accordance with the applicable electrical conductivity acceptance criteria of Table 3.

4.1.5 Cross-sectional dimensions (outside diameter and wall thickness, or inside diameter and wall thickness for round tube; for tube other than round, square, rectangular, hexagonal, or octagonal with sharp corners, a drawing is required) (see Tables X1.1 and X1.2),[10]

4.1.6 Length (straight or coiled),

[10] These tables are taken from American National Standard B 32.5, Preferred Metric Sizes for Tubular Metal Products Other Than Pipe.

TABLE 3 Lot Acceptance Criteria for Resistance to Stress-Corrosion

Alloy and Temper	Lot Acceptance Criteria		Lot Acceptance Status
	Electrical Conductivity,[A,B] % IACS	Level of Mechanical Properties	
7075-T73	40.0 or greater	per specified requirements	acceptable
	38.0 through 39.9	per specified requirements and yield strength does not exceed minimum by more than 82 MPa	acceptable
	38.0 through 39.9	per specified requirements but yield strength exceeds minimum by more than 82 MPa	unacceptable[C]
	less than 38.0	any level	unacceptable[C]

[A]The electrical conductivity shall be determined in accordance with Test Method E 1004 in the following locations:

Wall Thickness, mm	Location
Up through 2.50	surface of tensile sample
Over 2.50	subsurface after removal of approximately 10 % of thickness[A,B]

[A]For curved surfaces, the conductivity shall be measured on a machined flat spot; however, for small size tubes, a cut-out piece may be flattened and the conductivity determined.

[B]When material is found to be unacceptable, it shall be reprocessed (additional precipitation heat treatment or re-solution heat treatment and precipitation heat treatment).

4.1.7 Nominal inside diameter of coils and mass, or maximum outside diameter, if applicable,

4.1.8 For alloy Alclad 3003, Alclad 3102, or Alclad 3303 state clad inside or outside (17.1),

4.2 Additionally, orders for material to this specification shall include the following information when required by the purchaser:

4.2.1 Whether heat treatment in accordance with Practice B 597 is required (11.2),

4.2.2 Whether flattening tests are required (Section 9 and Table 4),

4.2.3 Whether flare testing is required (Section 10),

TABLE 4 Minimum Outside Diameter Flattening Factor

Alloy	Temper	Wall Thickness, mm		Minimum Diameter Flattening Factor, *F*
		Over	Through	
1100	O	0.32	12.50	2
	H12	0.32	12.50	3
	H14	0.32	12.50	6
	H16	0.32	12.50	8
3003	O	0.63	12.50	2
	H12	0.63	12.50	3
	H14	0.63	12.50	6
	H16	0.63	12.50	8
2024	O	0.45	1.20	3
		1.20	12.50	4
	T3	0.45	12.50	8
5052	O	0.25	11.50	3
	H32	0.25	11.50	6
	H34	0.25	11.50	8
5086	O	0.25	11.50	3
	H32	0.25	11.50	8
6061	O	0.45	3.20	3
		3.20	6.30	4
		6.30	12.50	6
	T4	0.63	12.50	6
	T6	0.63	12.50	8
7075	O	0.63	1.20	4
		1.20	6.30	5
	T6	0.63	6.30	10

4.2.4 Whether 7075-O material is required to develop requirements for T73 temper (12.3),

4.2.5 Whether testing for leaks is required and, when leaks are allowed, the number of leaks allowed and the manner of marking leaks (15.1.3.2),

4.2.6 Whether inside cleanness test is required on coiled tubes (16.2) and frequency of testing required,

4.2.7 Whether inspection or witness of inspection and tests by the purchaser's representative is required prior to material shipment (Section 20),

4.2.8 Whether certification is required (Section 22),

4.2.9 Whether marking for identification is required (Section 23), and

4.2.10 Whether Practices B 660 applies, and if so, the levels of preservation, packaging, and packing required (Section 24).

5. Manufacture

5.1 The tube shall be produced by drawing an extruded tube made from hollow extrusion ingot (cast in hollow form or pierced) and extruded by the use of the die and mandrel method.

5.2 The ends of coiled tube shall be crimped or otherwise sealed to avoid contamination during shipment.

6. Responsibility for Quality Assurance

6.1 *Responsibility for Inspection and Tests*—Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection and test requirements specified herein. The producer may use his own or any other suitable facilities for the performance of the inspection and test requirements specified herein, unless disapproved by the purchaser in the order or at the time of signing the contract. The purchaser shall have the right to perform any of the inspections and tests set forth in this specification where such inspections are deemed necessary to ensure that material conforms to prescribed requirements.

6.2 *Lot Definition*—An inspection lot shall be defined as follows:

6.2.1 For heat-treated tempers an inspection lot shall consist of an identifiable quantity of material of the same mill form, alloy, temper, and nominal dimensions traceable to a heat-treat