



SUPERIOR. SAFE. SEAMLESS. ALUMINUM MINE PIPE SYSTEM.

SCHEDULE 40 PIPE

Nominal Size (Inches)	Outer Diameter (Inches)	Wall Thickness (Inches)	Wt/100 ft (pounds)	Standard Lengths ¹ (feet)	Approximate Bursting Pressure ² (lbs/sq inch)	Suggested Maximum Working Pressure ³ (lbs/sq inch)
2	2.375	.154	126.4	20-40	3890	1200
3	3.500	.216	262.1	20-40	3700	1130
4	4.500	.237	373.3	20-40	3160	960
6	6.625	.280	656.4	20-30-40	2540	770
8	8.625	.322	987.8	20-30-40	2240	680

SCHEDULE 10 PIPE

Nominal Size (Inches)	Outer Diameter (Inches)	Wall Thickness (Inches)	Wt/100 ft (pounds)	Standard Lengths ¹ (feet)	Approximate Bursting Pressure ² (lbs/sq inch)	Suggested Maximum Working Pressure ³ (lbs/sq inch)
2	2.375	.109	91.3	20-30-40	2750	830
3	3.500	.120	149.8	20-30-40	2060	620
4	4.500	.120	194.2	20-30-40	1600	480
6	6.625	.134	321.4	20-30-40	1210	360
8	8.625	.148	463.5	20-30-40	1030	310

¹Non-standard lengths available, subject to inquiry.

²Bursting pressures were calculated using the Barlow formula and the nominal wall thickness and minimum ultimate strength of alloy 6063-T6. These do not include a factor of safety. Values rounded to the nearest 10 psig.

³Suggested maximum working pressures are based on the American National Standard Code for Pressure Piping ANSI B31.1 Alloy 6063-T6.

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Estimated Loss in Head—Feet of Water Per 100 Feet of Pipe Without Couplers—Water at 60°F

NOMINAL PIPE SIZE, SCHEDULE 40 PIPE²

Gallons Per Minute	Cubic Feet Per Second	2 in. 2.375 x .154	3 in. 3.500 x .216	4 in. 4.500 x .237	6 in. 6.625 x 280	8 in. 8.625 x .322
25	.056					
30	.067	1.63				
35	.078	2.14				
40	.089	2.71				
45	.100	3.33				
50	.111	4.01				
60	.134	5.62	0.85			
70	.156	7.39	1.11			
80	.178	9.37	1.41			
90	.201	11.66	1.75			
100	.223	14.07	2.11	0.57		
120	.267	19.48	2.91	0.79		
140	.312		3.86	1.05		
160	.357		4.92	1.33		
180	.401		6.07	1.64		
200	.446		7.35	1.99		
220	.490		8.72	2.36		
240	.54		10.40	2.81	0.39	
260	.58			3.20	0.45	
280	.62			3.61	0.50	
300	.67			4.15	0.58	
350	.78			5.47	0.76	
400	.89			6.95	0.96	
450	1.00				1.19	
500	1.12				1.46	0.39
550	1.23				1.73	0.46
600	1.34				2.02	0.54
650	1.45				2.33	0.62
700	1.56				2.67	0.71
750	1.67				3.02	0.80
800	1.79				3.43	0.91
850	1.90				3.82	1.01
900	2.01				4.23	1.12
950	2.12					1.24
1000	2.23					1.36
1100	2.46					1.62
1200	2.68					1.90
1300	2.90					2.19
1400	3.12					2.50
1500	3.34					2.84
1600	3.57					3.20
1700	3.79					3.57
1800	4.01					
1900	4.24					
2000	4.46					

¹Based on the Darcy-Weisbach formula: $H = f \left(\frac{L}{D} \right) \frac{V^2}{2g}$

The friction factor "f" obtained from the "smooth pipe" curve of the Moody Diagram.

²Outer diameter and wall thickness are shown in inches.

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Estimated Loss in Head—Feet of Water Per 100 Feet of Pipe Without Couplers—Water at 60°F

NOMINAL PIPE SIZE, SCHEDULE 10 PIPE²

Gallons Per Minute	Cubic Feet Per Second	2 in. 2.375 x .109	3 in. 3.500 x .120	4 in. 4.500 x .120	6 in. 6.625 x .134	8 in. 8.625 x .148
25	.056					
30	.067					
35	.078	1.74				
40	.089	2.21				
45	.100	2.72				
50	.111	3.27				
60	.134	4.58				
70	.156	6.02				
80	.178	7.63	1.05			
90	.201	9.50	1.30			
100	.223	11.46	1.57			
120	.267	15.86	2.17	0.60		
140	.312		2.86	0.80		
160	.357		3.65	1.02		
180	.401		4.50	1.25		
200	.446		5.46	1.52		
220	.490		6.47	1.80		
240	.54		7.72	2.14		
260	.58		8.79	2.43		
280	.62			2.75		
300	.67			3.16	0.46	
350	.78			4.16	0.60	
400	.89			5.29	0.77	
450	1.00			6.54	0.95	
500	1.12				1.16	0.32
550	1.23				1.38	0.38
600	1.34				1.61	0.44
650	1.45				1.86	0.51
700	1.56				2.12	0.58
750	1.67				2.40	0.65
800	1.79				2.72	0.74
850	1.90				3.03	0.83
900	2.01				3.36	0.91
950	2.12				3.71	1.01
1000	2.23				4.06	1.10
1100	2.46					1.32
1200	2.68					1.54
1300	2.90					1.78
1400	3.12					2.04
1500	3.34					2.31
1600	3.57					2.60
1700	3.79					2.91
1800	4.01					3.22
1900	4.24					
2000	4.46					

¹Based on the Darcy-Weisbach formula: $H = f \left(\frac{L}{D} \right) \frac{V^2}{2g}$

The friction factor "f" obtained from the "smooth pipe" curve of the Moody Diagram.

²Outer diameter and wall thickness are shown in inches.

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Designation: B 241/B 241M-96

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Used in USNRC-RDT standards

Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube¹

This standard is issued under the fixed designation B 241/B 241M; 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.

1. Scope*

1.1 This specification² covers aluminum and aluminum-alloy seamless pipe in the alloys (Note 1) and tempers shown in Table 2 [Table 2M] and extruded round seamless tube in the alloys and tempers shown in Table 3 [Table 3M] intended for pressure applications. The standard sizes for seamless pipe are listed in Table 16.7 of ANSI H35.2 and H35.2M. Nonstandard alloys, tempers, and sizes of pipe are produced as seamless extruded tube.

NOTE 1—Throughout this specification, use of the term *alloy*, in the general sense, includes aluminum as well as aluminum alloy.

NOTE 2—For other seamless drawn tubes, see Specification B 210 or Specification B 483. For extruded tube see Specification B 221, and for structural pipe and tube see Specification B 429.

1.2 Alloy and temper designations are in accordance with ANSI H35.1 and 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 For acceptance criteria for inclusion of new aluminum and aluminum alloys in this specification, see Annex A2.

1.4 The values stated in either inch-pound or SI units are to be regarded separately as standard. The SI units are shown either in brackets or in separate tables. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems will result in non-conformance with this specification.

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:

2.1.1 ASTM Standards

B 557 Test Methods of Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products³

- B 557M Test Methods for Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products [Metric]³
- B 594 Practice for Ultrasonic Inspection of Aluminum-Alloy Wrought Products for Aerospace Applications³
- B 597 Practice for Heat Treatment of Aluminum Alloys³
- B 647 Test Method for Indentation Hardness of Aluminum Alloys by Means of a Webster Hardness Gage³
- B 648 Test Method for Indentation Hardness of Aluminum Alloys by Means of a Barcol Impressor³
- B 660 Practices for Packaging/Packing of Aluminum and Magnesium Products³
- B 666/B 666M Practice for Identification Marking of Aluminum Products³
- B 807 Practice for Extrusion Press Solution Heat Treatment of Aluminum Alloys³
- E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials⁴
- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁵
- E 34 Test Methods for Chemical Analysis of Aluminum and Aluminum Base Alloys⁶
- E 55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition⁶
- E 101 Test Method for Spectrographic Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique⁶
- E 227 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique⁶
- E 527 Practice for Numbering Metals and Alloys (UNS)⁷
- E 607 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique, Nitrogen Atmosphere⁸
- E 716 Practices for Sampling Aluminum and Aluminum Alloys for Spectrochemical Analysis⁸
- E 1004 Test Method for Electromagnetic (Eddy-Current) Measurements of Electrical Conductivity⁹

¹This specification is under the jurisdiction of ASTM Committee B-7 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.03 on Aluminum Alloy Wrought Products.

Current edition approved April 10, 1996. Published June 1996. Originally published as B 241 – 49 T. Last previous edition B 241/B 241M – 95a.

²For ASME Boiler and Pressure Vessel Code applications see related Specifications SB-241/SB-241M in Section II of that Code.

³ Annual Book of ASTM Standards, Vol 02.02.

⁴ Annual Book of ASTM Standards, Vol 03.01.

⁵ Annual Book of ASTM Standards, Vol 14.02.

⁶ Annual Book of ASTM Standards, Vol 03.05.

⁷ Annual Book of ASTM Standards, Vol 01.01.

⁸ Annual Book of ASTM Standards, Vol 03.06.

⁹ Annual Book of ASTM Standards, Vol 03.03.

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

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Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube¹

This standard is issued under the fixed designation B 429; 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.

1. Scope*

1.1 This specification covers aluminum-alloy pipe and extruded tube in selected alloys and tempers and in standard sizes as shown in the tables in Appendix XI. This pipe and tube is intended for use in structural applications such as highway and bridge rails, chain-link fence posts, handrails, sign structures, awning supports, lighting brackets, etc. Structural pipe and tube is not intended for fluid-carrying applications involving pressure.

NOTE 1—For drawn seamless tube used in pressure applications see Specification B 210, and for seamless pipe and seamless extruded tube used in pressure applications see Specification B 241.

1.2 Alloy and temper designations are in accordance with ANSI H35.1. The equivalent Unified Numbering System alloy designations are those of Table 1 preceded by A9, for example, A96061 for alloy 6061 in accordance with Practice E 527.

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

1.4 The values stated in inch-pound units are the standard. The values given in parentheses are for information only.

2. Referenced Documents

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

2.1.1 ASTM Standards:

- B 557 Test Methods of Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products²
- B 597 Practice for Heat Treatment of Aluminum Alloys²
- B 660 Practices for Packaging/Packing of Aluminum and Magnesium Products²
- B 666 Practice for Identification Marking of Aluminum Products²
- B 807 Practice for Extrusion Press Solution Heat Treatment of Aluminum Alloys²

This specification has been approved for use by agencies of the Department of Defense. Consult the DoD Index of Specifications and Standards for the specific year of issue which has been adopted by the Department of Defense.

- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications³
- E 34 Test Methods for Chemical Analysis of Aluminum and Aluminum Base Alloys⁴
- E 55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition⁴
- E 101 Test Method for Spectrographic Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique⁴
- E 227 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique⁴
- E 527 Practice for Numbering Metals and Alloys (UNS)⁵
- E 607 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique, Nitrogen Atmosphere⁶
- E 716 Practices for Sampling Aluminum and Aluminum Alloys for Spectrochemical Analysis⁶
- 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 Discharge⁶

2.1.2 ANSI Standards:

- H35.1 Alloy and Temper Designations Systems for Aluminum²
- H35.2 Dimensional Tolerance for Aluminum Mill Products²

2.1.3 Military Standards:

- MIL-STD-129, Marking for Shipment and Storage⁷

2.1.4 Federal Standards:

- Fed. Std. No. 123 Marking for Shipment (Civil Agencies)⁷

3. Terminology

3.1 Definitions:

3.1.1 *extruded structural pipe*—extruded structural tube having certain standardized sizes of outside diameter and wall thickness commonly designated by "Nominal Pipe Sizes" and American National Standards Institute (ANSI) Schedule Numbers.

¹ This specification is under the jurisdiction of ASTM Committee B-7 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.03 on Aluminum Alloy Wrought Products.

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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 01.01.

⁶ Annual Book of ASTM Standards, Vol 03.06.

⁷ Available from Standardization Documents Order Desk, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NP0DS.

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

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