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An American National Standard

Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120[1]

This standard is issued under the fixed designation D1785; 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 U.S. Department of Defense.

~~ε[1] NOTE—10.2.1.4 was editorially corrected in March 2018.~~

1. Scope*

1.1 This specification covers poly(vinyl chloride) (PVC) pipe made in Schedule 40, 80, and 120 sizes and pressure-rated for water (see Appendix X1). Included are criteria for classifying PVC plastic pipe materials and PVC plastic pipe, a system of nomenclature for PVC plastic pipe, and requirements and test methods for materials, workmanship, dimensions, sustained pressure, burst pressure, flattening, and extrusion quality. Methods of marking are also given.

1.2 The products covered by this specification are intended for use with the distribution of pressurized liquids only, which are chemically compatible with the piping materials. Due to inherent hazards associated with testing components and systems with compressed air or other compressed gases some manufacturers do not allow pneumatic testing of their products. Consult with specific product/component manufacturers for their specific testing procedures prior to pneumatic testing.

NOTE 1—Pressurized (compressed) air or other compressed gases contain large amounts of stored energy which present serious saftey hazards should a system fail for any reason.

NOTE 2—This standard specifies dimensional, performance and test requirements for plumbing and fluid handling applications only. It does not include provisions for the use of these products for venting of combustion gases. UL 1738 is a standard that does include specific testing and marking requirements for flue gas venting products, including PVC.

1.3 The text of this specification references notes, footnotes, and appendixes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the specification.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 The following safety hazards caveat pertains only to the test methods portion, Section 8, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*A specific precautionary statement is given in Note 9.

NOTE 3—CPVC plastic pipes, Schedules 40 and 80, which were formerly included in this specification, are now covered by Specification F441/F441M.

[1] This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.25 on Vinyl Based Pipe.

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

NOTE 4—The sustained and burst pressure test requirements, and the pressure ratings in the Appendix X1, are calculated from stress values obtained from tests made on pipe 4 in. (100 mm) and smaller. However, tests conducted on pipe as large as ~~24-in. (600-mm)~~24 in. (600 mm) diameter have shown these stress values to be valid for larger diameter PVC pipe.

NOTE 5—PVC pipe made to this specification is often belled for use as line pipe. For details of the solvent cement bell, see Specification D2672 and for details of belled elastomeric joints, see Specifications D3139 and D3212.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D618 Practice for Conditioning Plastics for Testing
D1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure
D1599 Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings
D1600 Terminology for Abbreviated Terms Relating to Plastics
D1784 Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
D2152 Test Method for Adequacy of Fusion of Extruded Poly(Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
D2672 Specification for Joints for IPS PVC Pipe Using Solvent Cement
D2837 Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
D3139 Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
D3212 Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
F412 Terminology Relating to Plastic Piping Systems
F441/F441M Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80

2.2 *Federal Standard:*
Fed. Std. No. 123 Marking for Shipment (Civil Agencies)[3]

2.3 *Military Standard:*
MIL-STD-129 Marking for Shipment and Storage[3]

2.4 *NSF/ANSI Standards:*[4]
Standard No. 14 for Plastic Piping System Components and Related Materials
Standard No. 61 for Drinking Water System Components—Health Effects

2.5 *UL Standard:*[5]
UL 1738 Standard for Venting Systems for Gas-Burning Appliances, Categories II, III, and IV

3. Terminology

3.1 *Definitions:*—Definitions are in accordance with Terminology F412 and abbreviations are in accordance with Terminology D1600, unless otherwise specified. The abbreviation for poly(vinyl chloride) plastic is PVC.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *hydrostatic design stress*—the estimated maximum tensile stress the material is capable of withstanding continuously with a high degree of certainty that failure of the pipe will not occur. This stress is circumferential when internal hydrostatic water pressure is applied.

3.2.2 *pressure rating (PR)*—the estimated maximum water pressure the pipe is capable of withstanding continuously with a high degree of certainty that failure of the pipe will not occur.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from ~~Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D,~~ DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA ~~19111-5098, http://dodssp.daps.dla.mil.~~19111-5094, http://quicksearch.dla.mil.

[4] Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140, http://www.nsf.org.

[5] Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, http://www.ul.com.

3.2.3 *relation between dimensions, design stress, and pressure rating*—the following expression, commonly known as the ISO equation,[6] is used in this specification to relate dimensions, hydrostatic design stress, and pressure rating:

$$2S/P = (D_0/t) - 1$$

where~~*where:*~~:

S = hydrostatic design stress, psi (or MPa),
P = pressure rating, psi (or MPa),
D_0 = average outside diameter, in. (or mm), and
t = minimum wall thickness, in. (or mm).

3.2.4 *standard thermoplastic pipe materials designation code*—the pipe materials designation code shall consist of the abbreviation PVC for the type of plastic, followed by the ASTM type and grade in Arabic numerals and the design stress in units of 100 psi (0.7 MPa) with any decimal figures dropped. When the design stress code contains less than two figures, a cipher shall be used before the number. Thus a complete material code shall consist of three letters and four figures for PVC plastic pipe materials (see Section 5).

4. Classification

4.1 *General*—This specification covers PVC pipe made to and marked with one of six type/grade/design stress designations (see X1.2) in Schedule 40, 80, and 120 wall sizes.

4.2 *Hydrostatic Design Stresses*—This specification covers pipe made from PVC plastics as defined by four hydrostatic design stresses which have been developed on the basis of long-term tests (Appendix X1).

5. Materials and Manufacture

5.1 *General*—Poly(vinyl chloride) plastics used to make pipe meeting the requirements of this specification are categorized by means of two criteria, namely, (*1*) short-term strength tests and (*2*) long-term strength tests.

NOTE 6—The PVC pipe intended for use in the transport of potable water should be evaluated and certified as safe for this purpose by a testing agency acceptable to the local health authority. The evaluation should be in accordance with requirements for chemical extraction, taste, and odors that are no less restrictive than those included in NSF/ANSI Standard No. 14. The seal or mark of the laboratory making the evaluation should be included on the pipe. See pipe marking requirement for reclaimed water systems.

5.2 *Basic Materials*—This specification covers pipe made from PVC plastics having certain physical and chemical properties as described in Specification D1784.

5.3 *Compound*—The PVC compounds used for this pipe shall equal or exceed the following classes described in Specification D1784; PVC 12454, or 14333.

5.4 *Rework Material*—The manufacturer shall use only his own clean rework pipe material and the pipe produced shall meet all the requirements of this specification.

6. Requirements

6.1 *Dimensions and Tolerances:*

6.1.1 Dimensions and tolerances shall be as shown in Table 1 and Table 2 when measured in accordance with Test Method D2122. The tolerances for out-of-roundness shall apply only to pipe prior to shipment.

6.2 *Sustained Pressure*—The pipe shall not fail, balloon, burst, or weep as defined in Test Method D1598, at the test pressures given in Tables 3-5 when tested in accordance with 8.4.

[6] ISO R161-1960, Pipes of Plastics Materials for the Transport of Fluids (Outside Diameters and Nominal Pressures) Part 1, Metric Series.

TABLE 1 Outside Diameters and Tolerances for PVC Plastic Pipe Schedules 40, 80, and 120, in. (mm)

Nominal Pipe Size	Outside Diameter	Tolerances		
		Average	Maximum Out-of-Roundness (maximum minus minimum diameter)	
			Schedule 40 sizes 3½ in. and over; Schedule 80 sizes 8 in. and over	Schedule 40 sizes 3 in. and less; Schedule 80 sizes 6 in. and less; Schedule 120 sizes all
⅛	0.405 (10.29)	±0.004 (±0.10)	. . .	0.016 (0.41)
¼	0.540 (13.72)	±0.004 (±0.10)	. . .	0.016 (0.41)
⅜	0.675 (17.14)	±0.004 (±0.10)	. . .	0.016 (0.41)
½	0.840 (21.34)	±0.004 (±0.10)	. . .	0.016 (0.41)
¾	1.050 (26.67)	±0.004 (±0.10)	. . .	0.020 (0.51)
1	1.315 (33.40)	±0.005 (±0.13)	. . .	0.020 (0.51)
1¼	1.660 (42.16)	±0.005 (±0.13)	. . .	0.024 (0.61)
1½	1.900 (48.26)	±0.006 (±0.15)	. . .	0.024 (0.61)
2	2.375 (60.32)	±0.006 (±0.15)	. . .	0.024 (0.61)
2½	2.875 (73.02)	±0.007 (±0.18)	. . .	0.030 (0.76)
3	3.500 (88.90)	±0.008 (±0.20)	. . .	0.030 (0.76)
3½	4.000 (101.60)	±0.008 (±0.20)	0.100 (2.54)	0.030 (0.76)
4	4.500 (114.30)	±0.009 (±0.23)	0.100 (2.54)	0.030 (0.76)
5	5.563 (141.30)	±0.010 (±0.25)	0.100 (2.54)	0.060 (1.52)
6	6.625 (168.28)	±0.011 (±0.28)	0.100 (2.54)	0.070 (1.78)
8	8.625 (219.08)	±0.015 (±0.38)	0.150 (3.81)	0.090 (2.29)
10	10.750 (273.05)	±0.015 (±0.38)	0.150 (3.81)	0.100 (2.54)
12	12.750 (323.85)	±0.015 (±0.38)	0.150 (3.81)	0.120 (3.05)
14	14.000 (355.60	±0.015 (±0.38)	0.200 (5.08)	. . .
16	16.000 (406.40)	±0.019 (±0.48)	0.320 (8.13)	. . .
18	18.000 (457.20)	±0.019 (±0.48)	0.360 (9.14)	. . .
20	20.000 (508.00)	±0.023 (±0.58)	0.400 (10.2)	. . .
24	24.000 (609.60)	±0.031 (±0.79)	0.480 (12.2)	. . .

TABLE 2 Wall Thicknesses and Tolerances for PVC Plastic Pipe, Schedules 40, 80, and 120,[A,B] in. (mm)

Nominal Pipe Size	Wall Thickness[A]					
	Schedule 40		Schedule 80		Schedule 120	
	Minimum	Tolerance	Minimum	Tolerance	Minimum	Tolerance
⅛	0.068 (1.73)	+0.020 (+0.51)	0.095 (2.41)	+0.020 (+0.51)	. . .	. . .
¼	0.088 (2.24)	+0.020 (+0.51)	0.119 (3.02)	+0.020 (+0.51)	. . .	. . .
⅜	0.091 (2.31)	+0.020 (+0.51)	0.126 (3.20)	+0.020 (+0.51)	. . .	. . .
½	0.109 (2.77)	+0.020 (+0.51)	0.147 (3.73)	+0.020 (+0.51)	0.170 (4.32)	+0.020 (+0.51)
¾	0.113 (2.87)	+0.020 (+0.51)	0.154 (3.91)	+0.020 (+0.51)	0.170 (4.32)	+0.020 (+0.51)
1	0.133 (3.38)	+0.020 (+0.51)	0.179 (4.55)	+0.021 (+0.53)	0.200 (5.08)	+0.024 (+0.61)
1¼	0.140 (3.56)	+0.020 (+0.51)	0.191 (4.85)	+0.023 (+0.58)	0.215 (5.46)	+0.026 (+0.66)
1½	0.145 (3.68)	+0.020 (+0.51)	0.200 (5.08)	+0.024 (+0.61)	0.225 (5.72)	+0.027 (+0.68)
2	0.154 (3.91)	+0.020 (+0.51)	0.218 (5.54)	+0.026 (+0.66)	0.250 (6.35)	+0.030 (+0.76)
2½	0.203 (5.16)	+0.024 (+0.61)	0.276 (7.01)	+0.033 (+0.84)	0.300 (7.62)	+0.036 (+0.91)
3	0.216 (5.49)	+0.026 (+0.66)	0.300 (7.62)	+0.036 (+0.91)	0.350 (8.89)	+0.042 (+1.07)
3½	0.226 (5.74)	+0.027 (+0.68)	0.318 (8.08)	+0.038 (+0.96)	0.350 (8.89)	+0.042 (+1.07)
4	0.237 (6.02)	+0.028 (+0.71)	0.337 (8.56)	+0.040 (+1.02)	0.437 (11.10)	+0.052 (+1.32)
5	0.258 (6.55)	+0.031 (+0.79)	0.375 (9.52)	+0.045 (+1.14)	0.500 (12.70)	+0.060 (+1.52)
6	0.280 (7.11)	+0.034 (+0.86)	0.432 (10.97)	+0.052 (+1.32)	0.562 (14.27)	+0.067 (+1.70)
8	0.322 (8.18)	+0.039 (+0.99)	0.500 (12.70)	+0.060 (+1.52)	0.718 (18.24)	+0.086 (+2.18)
10	0.365 (9.27)	+0.044 (+1.12)	0.593 (15.06)	+0.071 (+1.80)	0.843 (21.41)	+0.101 (+2.56)
12	0.406 (10.31)	+0.049 (+1.24)	0.687 (17.45)	+0.082 (+2.08)	1.000 (25.40)	+0.120 (+3.05)
14	0.437 (11.10)	+0.053 (+1.35)	0.750 (19.05)	+0.090 (+2.29)	. . .	. . .
16	0.500 (12.70)	+0.060 (+1.52)	0.843 (21.41)	+0.101 (+2.57)	. . .	. . .
18	0.562 (14.27)	+0.067 (+1.70)	0.937 (23.80)	+0.112 (+2.84)	. . .	. . .
20	0.593 (15.06)	+0.071 (+1.80)	1.031 (26.19)	+0.124 (+3.15)	. . .	. . .
24	0.687 (17.45)	+0.082 (+2.08)	1.218 (30.94)	+0.146 (+3.71)	. . .	. . .

[A] The minimum is the lowest wall thickness of the pipe at any cross section. The maximum permitted wall thickness, at any cross section, is the minimum wall thickness plus the stated tolerance. All tolerances are on the plus side of the minimum requirement.
[B] These dimensions conform to nominal IPS dimensions, with the exception that Schedule 120 wall thickness for pipe sizes ½ to 3½ in. (12.5 to 87.5 mm), inclusive, are special PVC plastic pipe sizes.

6.2.1 *Accelerated Regression Test*—The accelerated regression test shall be used in place of both the sustained and burst pressure tests, at the option of the manufacturer. The test shall be conducted in accordance with 8.4.1. The pipe shall demonstrate a hydrostatic design basis projection at the 100 000-h intercept that meets the hydrostatic design basis category requirement (see

TABLE 3 Sustained Pressure Test Conditions for Water at ~~73°F~~73 °F (~~23°C~~)(23 °C) for PVC Plastic Pipe, Schedule 40

Nominal Pipe Size	Pressure Required for Test[A]			
	PVC1120 PVC1220 PVC2120	PVC2116	PVC2112	PVC2110
in.	psi			
⅛	1690	1360	1130	930
¼	1640	1310	1090	900
⅜	1310	1050	870	720
½	1250	1000	840	690
¾	1010	810	680	550
1	950	760	630	520
1¼	770	620	520	420
1½	690	560	460	380
2	580	470	390	320
2½	640	510	430	350
3	590	440	370	300
3½	500	400	340	280
4	470	370	310	260
5	410	330	270	220
6	370	300	250	200
8	330	260	220	180
10	300	240	200	160
12	280	220	180	150
14	270	220	180	150
16	270	220	180	150
18	270	220	180	150
20	260	210	170	140
24	250	200	170	140
in.	MPa			
⅛	11.65	9.38	7.79	6.41
¼	11.31	9.03	7.52	6.21
⅜	9.03	7.24	6.00	4.96
½	8.62	6.89	5.79	4.76
¾	6.96	5.58	4.69	3.79
1	6.55	5.24	4.34	3.59
1¼	5.31	4.27	3.59	2.90
1½	4.76	3.86	3.17	2.62
2	4.00	3.24	2.69	2.21
2½	4.41	3.52	2.96	2.41
3	4.07	3.03	2.55	2.07
3½	3.45	2.76	2.34	1.93
4	3.24	2.55	2.14	1.79
5	2.83	2.28	1.86	1.52
6	2.55	2.07	1.72	1.38
8	2.28	1.79	1.52	1.24
10	2.07	1.65	1.38	1.10
12	1.93	1.52	1.24	1.03
14	1.89	1.54	1.26	1.05
16	1.89	1.54	1.26	1.05
18	1.89	1.54	1.26	1.05
20	1.82	1.47	1.19	0.98
24	1.75	1.40	1.19	0.98
~~in.~~	~~MPa~~			
~~⅛~~	~~11.65~~	~~9.38~~	~~7.79~~	~~6.41~~
~~¼~~	~~11.31~~	~~9.03~~	~~7.52~~	~~6.21~~
~~⅜~~	~~9.03~~	~~7.24~~	~~6.00~~	~~4.96~~
~~½~~	~~8.62~~	~~6.89~~	~~5.79~~	~~4.76~~
~~¾~~	~~6.96~~	~~5.58~~	~~4.69~~	~~3.79~~
~~1~~	~~6.55~~	~~5.24~~	~~4.34~~	~~3.59~~
~~1¼~~	~~5.31~~	~~4.27~~	~~3.59~~	~~2.90~~
~~1½~~	~~4.76~~	~~3.86~~	~~3.17~~	~~2.62~~
~~2~~	~~4.00~~	~~3.24~~	~~2.69~~	~~2.21~~
~~2½~~	~~4.41~~	~~3.52~~	~~2.96~~	~~2.41~~
~~3~~	~~4.07~~	~~3.03~~	~~2.55~~	~~2.07~~
~~3½~~	~~3.45~~	~~2.76~~	~~2.34~~	~~1.93~~
~~4~~	~~3.24~~	~~2.55~~	~~2.14~~	~~1.79~~
~~5~~	~~2.83~~	~~2.28~~	~~1.86~~	~~1.52~~
~~6~~	~~2.55~~	~~2.07~~	~~1.72~~	~~1.38~~
~~8~~	~~2.28~~	~~1.79~~	~~1.52~~	~~1.24~~
~~10~~	~~2.07~~	~~1.65~~	~~1.38~~	~~1.10~~
~~12~~	~~1.93~~	~~1.52~~	~~1.24~~	~~1.03~~
~~14~~	~~1.89~~	~~1.54~~	~~1.26~~	~~1.05~~

~~16~~	~~1.89~~	~~1.54~~	~~1.26~~	~~1.05~~
~~18~~	~~1.89~~	~~1.54~~	~~1.26~~	~~1.05~~
~~20~~	~~1.82~~	~~1.47~~	~~1.19~~	~~0.98~~
~~24~~	~~1.75~~	~~1.40~~	~~1.19~~	~~0.98~~

[A] The fiber stresses used to derive these test pressures are as follows:

	psi	MPa
PVC1120	4200	29.0
PVC1220	4200	29.0
PVC2120	4200	29.0
PVC2116	3360	23.2
PVC2112	2800	19.3
PVC2110	2300	15.9
~~PVC1120~~	~~4200~~	~~29.0~~
~~PVC1220~~	~~4200~~	~~29.0~~
~~PVC2120~~	~~4200~~	~~29.0~~
~~PVC2116~~	~~3360~~	~~23.2~~
~~PVC2112~~	~~2800~~	~~19.3~~
~~PVC2110~~	~~2300~~	~~15.9~~

TABLE 4 Sustained Pressure Test Conditions for Water at ~~73°F~~73 °F (~~23°C~~)(23 °C) for PVC Plastic Pipe, Schedule 80

Nominal Pipe Size	Pressure Required for Test[A]			
	PVC1120 PVC1220 PVC2120	PVC2116	PVC2112	PVC2110
in.		psi		
⅛	2570	2060	1720	1410
¼	2370	1900	1580	1300
⅜	1930	1540	1290	1060
½	1780	1430	1190	980
¾	1440	1160	960	790
1	1320	1060	880	720
1¼	1090	870	730	600
1½	990	790	660	540
2	850	680	570	460
2½	890	710	590	490
3	790	630	520	430
3½	730	580	480	400
4	680	540	450	370
5	610	490	400	330
6	590	470	390	320
8	520	410	340	280
10	490	390	330	270
12	480	380	320	260
14	470	380	320	260
16	470	370	310	260
18	460	370	310	250
20	460	370	300	250
24	450	360	300	250
in.		MPa		
⅛	17.72	14.21	11.86	9.72
¼	16.34	13.10	10.90	8.96
⅜	13.31	10.62	8.89	7.31
½	12.27	9.86	8.20	6.76
¾	9.93	8.00	6.62	5.45
1	9.10	7.31	6.07	4.96
1¼	7.52	6.00	5.03	4.14
1½	6.83	4.96	4.55	3.72
2	5.86	4.69	3.93	3.17
2½	6.14	4.90	4.07	3.38
3	5.45	4.34	3.59	2.96
3½	5.03	4.00	3.31	2.76
4	4.69	3.72	3.10	2.55
5	4.21	3.38	2.76	2.28
6	4.07	3.24	2.69	2.21
8	3.59	2.83	2.34	1.93
10	3.38	2.69	2.28	1.86
12	3.31	2.62	2.21	1.79
14	3.29	2.66	2.24	1.82
16	3.29	2.59	2.17	1.82
18	3.22	2.59	2.17	1.75
20	3.22	2.59	2.10	1.75
24	3.15	2.52	2.10	1.75
~~in.~~		~~MPa~~		
~~⅛~~	~~17.72~~	~~14.21~~	~~11.86~~	~~9.72~~
~~¼~~	~~16.34~~	~~13.10~~	~~10.90~~	~~8.96~~
~~⅜~~	~~13.31~~	~~10.62~~	~~8.89~~	~~7.31~~
~~½~~	~~12.27~~	~~9.86~~	~~8.20~~	~~6.76~~
~~¾~~	~~9.93~~	~~8.00~~	~~6.62~~	~~5.45~~
~~1~~	~~9.10~~	~~7.31~~	~~6.07~~	~~4.96~~
~~1¼~~	~~7.52~~	~~6.00~~	~~5.03~~	~~4.14~~
~~1½~~	~~6.83~~	~~4.96~~	~~4.55~~	~~3.72~~
~~2~~	~~5.86~~	~~4.69~~	~~3.93~~	~~3.17~~
~~2½~~	~~6.14~~	~~4.90~~	~~4.07~~	~~3.38~~
~~3~~	~~5.45~~	~~4.34~~	~~3.59~~	~~2.96~~
~~3½~~	~~5.03~~	~~4.00~~	~~3.31~~	~~2.76~~
~~4~~	~~4.69~~	~~3.72~~	~~3.10~~	~~2.55~~
~~5~~	~~4.21~~	~~3.38~~	~~2.76~~	~~2.28~~
~~6~~	~~4.07~~	~~3.24~~	~~2.69~~	~~2.21~~
~~8~~	~~3.59~~	~~2.83~~	~~2.34~~	~~1.93~~
~~10~~	~~3.38~~	~~2.69~~	~~2.28~~	~~1.86~~
~~12~~	~~3.31~~	~~2.62~~	~~2.21~~	~~1.79~~
~~14~~	~~3.29~~	~~2.66~~	~~2.24~~	~~1.82~~
~~16~~	~~3.29~~	~~2.59~~	~~2.17~~	~~1.82~~

~~18~~	~~3.22~~	~~2.59~~	~~2.17~~	~~1.75~~
~~20~~	~~3.22~~	~~2.59~~	~~2.10~~	~~1.75~~
~~24~~	~~3.15~~	~~2.52~~	~~2.10~~	~~1.75~~

[A] The fiber stresses used to derive these test pressures are as follows:

	psi	MPa
PVC1120	4200	29.0
PVC1220	4200	29.0
PVC2120	4200	29.0
PVC2116	3360	23.2
PVC2112	2800	19.3
PVC2110	2300	15.9

	~~psi~~	~~MPa~~
~~PVC1120~~	~~4200~~	~~29.0~~
~~PVC1220~~	~~4200~~	~~29.0~~
~~PVC2120~~	~~4200~~	~~29.0~~
~~PVC2116~~	~~3360~~	~~23.2~~
~~PVC2112~~	~~2800~~	~~19.3~~
~~PVC2110~~	~~2300~~	~~15.9~~

Tables 3-5 and Test Method D2837) for the PVC material used in its manufacture. (*Example:* PVC 1120 pipe must have a minimum 100 000-h projection of 3830 psi (26.40 MPa) and 85 % lower confidence limit (LCL).

6.3 *Burst Pressure*—The minimum burst pressures for PVC plastic pipe shall be as given in Table 6, when determined in accordance with Test Method D1599.

NOTE 7—Times greater than 60 s may be needed to bring large size specimens to burst pressure. The test is more difficult to pass using greater pressurizing times.

6.4 *Flattening*—There shall be no evidence of splitting, cracking, or breaking when the pipe is tested in accordance with 8.6.

6.5 *Extrusion Quality*—The pipe shall not flake or disintegrate when tested in accordance with Test Method D2152.

7. Workmanship, Finish, and Appearance

7.1 The pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, or other defects. The pipe shall be as uniform as commercially practicable in color, opacity, density, and other physical properties.

NOTE 8—Color and transparency or opacity should be specified in the contract or purchase order.

8. Test Methods

8.1 *Conditioning*—Condition the test specimens at ~~73.4~~74 °F ± ~~3.6°F (23~~4 °F (23 °C ± ~~2°C)~~2 °C) and ~~50~~50 % ± 10 % relative humidity for not less than 40 h prior to test in accordance with Procedure A of Practice D618, for those tests where conditioning is required.

8.2 *Test Conditions*—Conduct tests in the standard laboratory atmosphere of ~~73.4~~73 °F ± ~~3.6°F (23~~4 °F (23 °C ± ~~2°C)~~2 °C) and ~~50~~50 % ± 10 % relative humidity, unless otherwise specified in the test methods or in this specification.

8.3 *Sampling*—The selection of the sample or samples of pipe shall be as agreed upon by the purchaser and seller. In case of no prior agreement, any sample selected by the testing laboratory shall be deemed adequate.

8.3.1 *Test Specimens*—Not less than 50 % of the test specimens required for any pressure test shall have at least a part of the marking in their central sections. The central section is that portion of pipe which is at least one pipe diameter away from an end closure.

8.4 *Sustained Pressure Test*—Select the test specimens at random. Test individually with water at the internal pressures given in Tables 3-5, six specimens of pipe, each specimen at least ten times the nominal diameter in length, but not less than 10 in. (250 mm) or more than 3 ft (1 m) between end closures and bearing the permanent marking on the pipe. Maintain the specimens at the