

## STANDARDS

Standards exist to ensure that thermoplastic piping systems meet the required level of performance for a particular application. IPEX engineers and technical staff actively participate in thermoplastic standards development throughout North America. These activities result in new standards and improvements to existing standards for thermoplastic piping.

## Standards Organizations

IPEX products comply with standards developed by several standards organizations. Additional information on standards and compliance can be obtained by contacting the following organizations.

**CSA International, [www.csa.ca](http://www.csa.ca)  
5060 Spectrum Way, Mississauga, Ontario Canada L4W 5N6**

**ASTM International, [www.astm.org](http://www.astm.org)  
100 Barr Harbor Drive, West Conshohocken, Pennsylvania USA 19428-2959**

**Underwriters Laboratories of Canada, [www.ulc.ca](http://www.ulc.ca)  
7 Underwriters Rd, Toronto, Ontario Canada M1R 3B4**

**NSF International, [www.nsf.org](http://www.nsf.org)  
P.O. Box 130140, 789 N. Dixboro Rd, Ann Arbor, Michigan USA 48113-0140**

## Applicable Standards

The following is a list of applicable standards for IPEX PVC and CPVC piping systems. This list is up-to-date at the time of printing.

## ASTM

**Standard Specifications for Terminology Relating to Plastics**

- D 883 Terminology Relating to Plastics
- D 1600 Terminology for Abbreviated Terms Relating to Plastics
- F 412 Terminology Relating to Plastic Piping Systems
- D 2749 Standard Symbols for Dimensions of Plastic Pipe Fittings

**Standard Specifications for Plastic Materials**

- D 1784 Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- D 2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
- D 2672 Joints for IPS PVC Pipe Using Solvent Cement
- D 3138 Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components
- D 3915 Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings used in Pressure Applications
- D 4396 Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Nonpressure Applications
- F 493 Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings
- F 656 Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings

**Standard Specifications for Plastic Pipe**

- D 1785 Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
- D 2241 Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
- D 2665 Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- D 3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
- D 3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- F 441/ F 441M Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80
- F 442/ F 442M Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)
  - F 477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe
  - F 480 Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), Sch 40 & Sch 80
  - F 913 Thermoplastic Elastomeric Seals (Gaskets) for Joining Plastic Pipe

**Standard Specifications for Plastic Pipe Fittings**

- D 2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings Schedule 80
- D 2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- D 2467 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- D 2665 Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
  - F 437 Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
  - F 438 Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40
  - F 439 Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- F 1803 Poly (Vinyl Chloride) (PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter
- F 1866 Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings
- F 1970 Special Engineered Fittings, Appurtenances or Valves for use in Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) systems

**Standard Specifications for Method of Test**

- D 256 Test Method for Determining the IZOD Pendulum Impact Resistance of Notched Specimens of Plastics
- D 570 Test Method for Water Absorption of Plastics
- D 635 Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
- D 638 Test Method for Tensile Properties of Plastics
- D 648 Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
- D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- D 1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure
- D 1599 Test Method for Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing and Fittings
- D 2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
- D 2152 Test Method for Adequacy of Fusion of Extruded Poly (Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
- D 2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D 2444 Test Method for Determination of Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- D 2837 Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
- D 3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- F 610/ F 610M Evaluating the Quality of Molded Poly (Vinyl Chloride) (PVC) Plastic Fittings by the Heat Reversion Technique

**Standard Specifications for Practices**

- D 543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents
- D 618 Practice for Conditioning Plastics for Testing
- D 2321 Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- D 2855 Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
- D 4703 Practice for Compression Molding Thermoplastic Materials into Test Specimens, Plaques or Sheets
- F 402 Practice for Safe Handling of Solvent Cements, Primers and Cleaners Used for Joining Thermoplastic Pipe and Fittings
- F 1057 Practice for Estimating the Quality of Extruded Poly (Vinyl Chloride) (PVC) Pipe by the Heat Reversion Technique

**NSF International**

- ANSI/NSF 14 Plastic Piping System Components and Related Materials
- ANSI/NSF 61 Drinking Water System Components – Health Effects

**CSA International**

- B137.0 Definitions, General Requirements and Methods of Testing for Thermoplastic Pressure Piping
- B137.2 PVC Injection-Molded Gasketed Fittings for Pressure Applications
- B137.3 Rigid Polyvinyl Chloride (PVC) Pipe for Pressure Applications
- B137.6 CPVC Pipe, Tubing and Fittings for Hot- and Cold-Water Distribution Systems
- B181.2 PVC Drain, Waste and Vent Pipe and Pipe Fittings

**NFPA/UL/ULC/ASTM – Burning**

- ASTM E 84 Test Method for Surface Burning Characteristics of Building Materials
- CAN/ULC S102.2 Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials
- NFPA255 Standard Method of Test of Surface Burning Characteristics of Building Materials
- UL 94 Test for Flammability of Plastic Materials for Parts in Devices and Appliances
- UL 723 Test for Surface Burning Characteristics of Building Materials

**TABLE A-14 DIMENSIONS, WEIGHTS & PRESSURE RATINGS FOR PVC & CPVC PIPE**

Schedule (DR) SDR	Nominal Pipe Size		Outside Diameter		Max Working Pressure		Min Wall Thickness		Avg Inside Diameter		Weight of pipe CPVC		Weight of pipe PVC	
	in	mm	in	mm	psi	kPa	in	mm	in	mm	lbs/ft	kg/m	lbs/ft	kg/m
Sch 80 (DR 4.5)	1/4	6	0.540	13.7	1130	7 790	0.119	3.02	.302	7.67	-	-	0.10	0.150
Sch 80 (DR 5.4)	3/8	10	0.675	17.1	920	6 340	0.126	3.20	.423	10.74	-	-	0.14	0.210
Sch 40 (DR 8)	1/2	12	0.840	21.3	600	4 140	0.109	2.76	.602	15.26	0.18	0.269	0.17	0.253
Sch 80 (DR 6)					850	5 860	0.147	3.72	.526	13.34	0.22	0.335	0.21	0.313
SDR 21					200	1 380	0.080	2.02	.660	16.74	-	-	0.13	0.193
Sch 40 (DR 10)	3/4	20	1.050	26.70	480	3 300	0.113	2.86	.804	20.46	0.24	0.354	0.22	0.327
Sch 80 (DR 7)					690	4 760	0.154	3.90	.722	18.38	0.31	0.456	0.28	0.417
SDR 21					200	1 380	0.060	2.02	.870	22.14	-	-	0.13	0.194
Sch 40 (DR 10)	1	25	1.315	33.40	450	3 100	0.133	3.38	1.029	26.14	0.35	0.522	0.33	0.491
Sch 80 (DR 8)					630	4 340	0.179	4.54	.936	23.78	0.45	0.663	0.41	0.610
SDR 21					200	1 380	0.080	2.02	1.135	28.84	-	-	0.21	0.313
Sch 40 (DR 12)	1 1/4	32	1.660	42.15	370	2 550	0.141	3.56	1.360	34.53	0.47	0.705	0.44	0.655
Sch 80 (DR 9)					520	3 590	0.191	4.84	1.255	31.87	0.62	0.919	0.57	0.848
SDR 21					200	1 380	0.080	2.02	1.480	37.59	-	-	0.27	0.402
Sch 40 (DR 13)	1 1/2	40	1.900	48.25	330	2 280	0.145	3.68	1.590	40.37	0.57	0.843	0.52	0.774
Sch 80 (DR 10)					470	3 240	0.200	5.08	1.476	37.49	0.75	1.115	0.69	1.026
SDR 21					200	1 380	0.090	2.28	1.700	43.17	-	-	0.35	0.521
SDR 26					160	1 100	0.080	2.02	1.720	43.69	-	-	0.32	0.476
Sch 40 (DR 16)	2	50	2.375	60.35	280	1 930	0.154	3.90	2.047	52.03	0.76	1.129	0.70	1.042
Sch 80 (DR 11)					400	2 760	0.218	5.54	1.913	48.61	1.04	1.545	0.96	1.429
SDR 21					200	1 380	0.113	2.86	2.129	54.11	-	-	0.54	0.804
SDR 26					160	1 100	0.091	2.30	2.173	55.23	-	-	0.45	0.670
Sch 40 (DR 14)					2 1/2	65	2.875	73.00	300	2 070	0.203	5.16	2.445	62.08
Sch 80 (DR 11)	420	2 900	0.276	7.00					2.290	58.16	1.58	2.356	1.46	2.173
SDR 21	200	1 380	0.137	3.48					2.581	65.54	-	-	0.78	1.161
SDR 26	160	1 100	0.110	2.78					2.635	66.92	-	-	0.64	0.952
Sch 40 (DR 16)	3	75	3.500	88.90	260	1 790	0.216	5.48	3.042	77.28	1.57	2.336	1.45	2.158
Sch 80 (DR 12)					370	2 550	0.300	7.62	2.864	72.74	2.12	3.153	1.96	2.917
SDR 21					200	1 380	0.167	4.24	3.146	79.92	-	-	1.14	1.697
SDR 26					160	1 100	0.135	3.42	3.210	81.54	-	-	0.94	1.399
SDR 32.5					125	860	0.108	2.74	3.264	82.90	-	-	0.77	1.146
SDR 41					100	690	0.085	2.16	3.310	84.08	-	-	0.63	0.938
Sch 40 (DR 19)	4	100	4.500	114.30	220	1 520	0.237	6.02	3.998	101.58	2.23	3.323	2.07	3.081
Sch 80 (DR 13)					320	2 210	0.337	8.56	3.786	96.16	3.10	4.610	2.87	4.271
SDR 21					200	1 380	0.214	5.44	4.046	102.76	-	-	1.88	2.798
SDR 26					160	1 100	0.173	4.38	4.133	105.00	-	-	1.54	2.292
SDR 32.5					125	860	0.138	3.50	4.204	106.78	-	-	1.25	1.860
SDR 41					100	690	0.110	2.78	4.260	108.22	-	-	1.02	1.518
Sch 40 (DR 22)	5	125	5.563	141.30	190	1 310	0.258	6.54	5.016	127.42	-	-	2.81	4.182
Sch 80 (DR 15)					290	2 000	0.375	9.52	4.768	121.12	-	-	4.02	5.982
SDR 21					200	1 380	0.265	6.72	5.001	127.04	-	-	2.88	4.286
SDR 26					160	1 100	0.214	5.44	5.107	129.74	-	-	2.35	3.497
SDR 32.5					125	860	0.171	4.34	5.199	132.08	-	-	1.89	2.813
SDR 41					100	690	0.136	3.44	5.271	133.90	-	-	1.53	2.277
Sch 40 (DR 24)	6	150	6.625	168.30	180	1 240	0.280	7.10	6.031	153.22	3.93	5.853	3.65	5.432
Sch 80 (DR 16)					280	1 930	0.432	10.96	5.709	145.04	5.91	8.793	5.48	8.155
SDR 21					200	1 380	0.315	8.02	5.955	151.28	-	-	4.09	6.087
SDR 26					160	1 100	0.255	6.48	6.084	154.56	-	-	3.33	4.956
SDR 32.5					125	860	0.204	5.18	6.193	157.32	-	-	2.69	4.003
SDR 41					100	690	0.161	4.12	6.281	159.56	-	-	2.15	3.200

psi @ 73°F

kPa @ 23°C

weight of pipe is for plain end

**TABLE A-14 DIMENSIONS, WEIGHTS & PRESSURE RATINGS FOR PVC & CPVC PIPE**

Schedule (DR) SDR	Nominal Pipe Size		Outside Diameter		Max Working Pressure		Min Wall Thickness		Avg Inside Diameter		Weight of pipe CPVC		Weight of pipe PVC	
	in	mm	in	mm	psi	kPa	in	mm	in	mm	lbs/ft	kg/m	lbs/ft	kg/m
Sch 40 (DR 27)	8	200	8.625	219.05	160	1 100	0.322	8.18	7.941	201.71	5.92	8.812	5.50	8.185
Sch 80 (DR 17)					250	1 720	0.500	12.70	7.565	192.13	8.98	13.366	8.32	12.382
SDR 21					200	1 380	0.411	10.40	7.756	196.99	-	-	6.91	10.283
SDR 26					160	1 100	0.332	8.42	7.921	201.79	-	-	5.65	8.408
SDR 32.5					125	860	0.266	6.72	8.063	204.79	-	-	4.55	6.771
SDR 41					100	690	0.210	5.32	8.180	207.77	-	-	3.63	5.402
Sch 40 (DR 30)	10	250	10.750	273.05	140	970	0.365	9.26	9.976	253.41	8.40	12.497	7.78	11.578
Sch 80 (DR 18)					230	1 590	0.593	15.06	9.493	241.13	13.32	19.816	11.81	17.576
SDR 21					200	1 380	0.512	12.98	9.667	245.55	-	-	10.73	15.968
SDR 26					160	1 100	0.413	10.48	9.874	250.81	-	-	8.76	13.036
SDR 32.5					125	860	0.331	8.40	10.048	255.23	-	-	7.08	10.536
SDR 41					100	690	0.262	6.66	10.195	258.95	-	-	5.64	8.393
Sch 40 (DR 32)	12	300	12.750	323.90	130	900	0.406	10.30	11.888	302.04	11.13	16.565	10.30	15.328
Sch 80 (DR 19)					230	1 590	0.687	17.44	11.294	286.92	18.35	27.310	16.98	25.269
SDR 21					200	1 380	0.607	15.38	11.465	291.28	-	-	15.10	22.471
SDR 26					160	1 100	0.490	12.44	11.711	297.52	-	-	12.35	18.379
SDR 32.5					125	860	0.392	9.96	11.919	302.78	-	-	9.94	14.792
SDR 41					100	690	0.311	7.90	12.091	307.16	-	-	7.94	11.816
Sch 40 (DR 32)	14	350	14.000	355.60	130	910	0.438	11.13	13.072	332.03	13.16	19.590	12.18	18.130
Sch 80 (DR 19)					220	1 540	0.750	19.05	12.412	315.22	21.96	32.680	20.34	30.270
SDR 21					200	1 380	0.665	16.88	12.590	319.80	-	-	18.18	27.065
SDR 26					160	1 100	0.538	13.66	12.859	326.62	-	-	14.88	22.144
SDR 32.5					125	860	0.431	10.76	13.100	332.78	-	-	11.83	17.615
SDR 41					100	690	0.342	8.66	13.277	337.24	-	-	9.58	14.260
Sch 40 (DR 32)	16	400	16.000	406.40	130	910	0.500	12.70	14.936	379.38	17.21	25.617	15.96	23.75
Sch 80 (DR 19)					220	1 540	0.843	21.41	14.224	361.29	28.09	41.801	26.03	38.74
SDR 21					200	1 380	0.760	19.30	14.388	365.48	-	-	23.76	35.36
SDR 26					160	1 100	0.615	15.62	14.696	373.28	-	-	19.41	28.89
SDR 32.5					125	860	0.492	12.32	14.970	380.24	-	-	15.47	22.99
SDR 41					100	690	0.391	9.90	15.172	385.38	-	-	12.52	18.63
Sch 40 (DR 32)	18	450	18.000	457.20	130	910	0.562	14.27	16.809	429.46	-	-	20.11	29.93
Sch 80 (DR 19)					220	1 540	0.937	23.80	16.014	406.76	-	-	32.76	48.75
SDR 21					200	1 380	0.857	21.72	16.182	411.14	-	-	30.11	44.81
SDR 26					160	1 100	0.693	17.60	16.531	419.88	-	-	24.62	36.64
SDR 32.5					125	860	0.554	14.06	16.825	427.36	-	-	19.86	29.55
SDR 41					100	690	0.440	11.14	17.065	433.46	-	-	15.92	23.69
Sch 40 (DR 34)	20	500	20.000	508.00	120	840	0.593	15.06	18.743	476.07	-	-	23.62	35.15
Sch 80 (DR 19)					220	1 450	1.031	26.19	17.814	452.48	-	-	40.09	59.66
SDR 21					200	1 380	0.952	24.12	17.982	456.86	-	-	37.17	55.32
SDR 26					160	1 100	0.770	19.56	18.368	466.54	-	-	30.37	45.20
SDR 32.5					125	860	0.615	15.62	18.696	474.88	-	-	24.47	36.42
SDR 41					100	690	0.489	12.42	18.963	481.66	-	-	19.61	29.18
Sch 40 (DR 35)	24	600	24.000	609.60	120	840	0.687	17.45	22.544	572.62	-	-	32.87	48.92
Sch 80 (DR 20)					210	1 470	1.218	30.94	21.418	544.02	-	-	56.88	84.65
SDR 21					200	1 380	1.143	28.96	21.576	548.20	-	-	53.54	79.68
SDR 26					160	1 100	0.924	23.46	22.041	559.86	-	-	43.77	65.14
SDR 32.5					125	860	0.740	18.80	22.431	569.74	-	-	35.35	52.61
SDR 41					100	690	0.585	14.86	22.760	578.10	-	-	28.12	41.84

psi @ 73°F  
 kPa @ 23°C  
 weight of pipe is for plain end