Dimensions & Pressure Ratings

PVC & CPVC pipe is produced in several different outside diameters, sizes and dimensions for different applications. Different classifications based on outside diameter are not interchangeable, but can often be connected with specialty adapter fittings.

Basic Pipe Sizing Classifications Based on Outside Diameter

• Iron Pipe Size (IPS) - PVC & CPVC Pressure Pipe and Drainage Waste & Vent DWV pipe, forms one of the most widely used sizing classifications including Schedule 40, 80 & 120 pipe and Class pipe in various Standard Dimension Ratios (SDR); plus several specialty piping products such as Spears® **FlameGuard®** CPVC Fire Sprinkler Systems, **LabWaste™** CPVC Corrosive Waste Drainage Systems, and Low Extractable PVC Systems for Ultra Pure Water.
• Plastic Irrigation Pipe (PIP) - PVC for agricultural irrigation
• Copper Tube Size (CTS) - CPVC for Hot & Cold Waste Distribution
• Plastic Sewer Main (Type PSM) - PVC for gravity sewer mains
• AWWA C900/905 - PVC with Cast Iron O.D. for municipal water systems

The following Pipe Dimension Reference chart is for quick reference to some of the commonly used sizing classifications and nominal sizes. The following pages give additional detail for widely used PVC & CPVC pipe in IPS and CTS sizes.

Pipe Dimension Reference Chart

Pipe Type O.D. Size SDR		LH PIP 91	80 PIP 51	100 PIP 41	125 PIP 32.5	CL 63 IPS 64	CL 100 IPS 41	SEWER PSM 35	CL 125 IPS 32.5	CL 160 IPS 26	CL 200 IPS 21	40 DWV IPS —	80 DWV IPS —	SCH 40 IPS —	SCH 80 IPS —	C-900 CI DR 18
4"	O.D.	4.130	4.130	4.130	4.130	4.500	4.500	4.215	4.500	4.500	4.500	4.500	4.500	4.500	4.500	4.800
	I.D.	4.000	3.968	3.928	3.876	4.360	4.280	3.89	4.224	4.154	4.072	3.998	3.786	3.998	3.786	4.22
	Wall	.065	.081	.101	.127	.070	.110	0.125	.138	.173	.214	.237	.337	.237	.337	.267
	PSI	43	80	100	125	63	100	117.5	125	160	200	100	100	220	320	150
6"	O.D.	6.140	6.140	6.140	6.140	6.625	6.625	6.275	6.625	6.625	6.625	6.625	6.625	6.625	6.625	6.900
	I.D.	6.000	5.898	5.840	5.762	6.417	6.301	5.742	6.217	6.115	5.993	6.031	5.709	6.031	5.709	6.08
	Wall	.070	.121	.150	.189	.104	.162	0.18	.204	.255	.316	.280	.432	.280	.432	.383
	PSI	43	80	100	125	63	100	117.5	125	160	200	100	100	180	280	150
8"	O.D.	8.160	8.160	8.160	8.160	8.625	8.625	8.4	8.625	8.625	8.625	8.625	8.625	8.625	8.625	9.050
	I.D.	7.984	7.840	7.762	7.658	8.355	8.205	7.665	8.095	7.961	7.805	7.943	7.565	7.943	7.565	7.97
	Wall	.088	.160	.199	.251	.135	.210	.024	.265	.332	.410	.322	.500	.322	.500	.503
	PSI	43	80	100	125	63	100	117.5	125	160	200	100	100	160	250	150
10"	O.D.	10.200	10.200	10.200	10.200	10.750	10.750	10.5	10.750	10.750	10.750	10.750	10.750	10.750	10.750	11.100
	I.D.	9.980	9.800	9.702	9.572	10.414	10.226	9.563	10.088	9.924	9.748	9.976	9.492	9.976	9.492	9.78
	Wall	.110	.200	.249	.314	.168	.262	0.3	.331	.413	.511	.365	.593	.365	.593	.617
	PSI	43	80	100	125	63	100	117.5	125	160	200	100	100	140	230	150
12"	O.D.	12.240	12.240	12.240	12.240	12.750	12.750	12.5	12.750	12.750	12.750	12.750	12.750	12.750	12.750	13.200
	I.D.	11.975	11.760	11.642	11.486	12.352	12.128	11.361	11.966	11.770	11.538	11.890	11.294	11.890	11.294	11.63
	Wall	.132	.240	.299	.377	.199	.311	0.36	.392	.490	.606	.406	.687	.406	.687	.733
	PSI	43	80	100	125	63	100	117.5	125	160	200	100	100	130	230	150
14"	O.D.	14.280	14.280	14.280	14.280	*	*	*	*	14	*	14.000	14.000	14.000	14.000	15.3
	I.D.	14.000	13.720	13.584	13.402					12.86		13.072	12.410	13.072	12.410	13.48
	Wall	.140	.280	.348	.439					0.538		.438	.750	.438	.750	0.85
	PSI	43	80	100	125					160		100	100	130	220	235
15"	O.D.	15.300	15.300	15.300	15.300	*	*	15.3	*	*	*	*	*	*	*	*
	I.D.	14.970	14.700	14.550	14.358			13.898								
	Wall	.165	.300	.375	.471			0.44								
	PSI	43	80	100	125			117.5								
16"	O.D.	*	*	*	*	*	*	*	*	16	*	16.000	16.000	16.000	16.000	17.4
	I.D.									14.696		14.940	14.214	14.940	14.214	15.35
	Wall									0.615		.500	.843	.500	.843	0.967
	PSI									160		100	100	130	220	235
18"	O.D.	18.360	18.701	18.701	18.701	*	18.000	18.701	*	18.000	*	18	18.000	18	18.000	19.5
	I.D	17.964	17.967	17.789	17.551		17.122	17.629		16.616		16.808	16.014	16.808	16.014	17.83
	Wall	.198	.367	.456	.575		.439	0.536		.692		0.562	.937	0.582	.937	1.083
	PSI	43	80	100	125		100	117.5		160		100	100	120	220	235
20"	O.D.	20.400	*	*	*	*	20.000	*	*	20.000	*	20	20	20	20	21.6
	I.D.	19.962					19.026			18.462		18.863	17.814	18.863	17.614	19.03
	Wall	.219					.487			.769		0.533	1.031	0.533	1.031	1.2
	PSI	43					100			160		100	100	120	220	235
21"	O.D.	*	22.047	22.047	22.047	*	*	22.047	*	*	*	*	*	*	*	*
	I.D.		21.183	20.971	20.691			20.783								
	Wall		.432	.538	.678			0.632								
	PSI		80	100	125			117.5								
24"	O.D.	*	24.803	24.803	24.803	*	24.000	24.8	*	24	*	24	24	24	24	25.800
	I.D.		23.831	23.593	23.277		22.748	23.381		22.043		22.54	21.418	22.54	21.418	23.73
	Wall		.486	.605	.763		.585	0.711		0.923		0.687	1.218	0.687	1.218	1.200
	PSI		80	100	125		100	117.5		160		100	100	120	210	235

*Information Not Available

Dimensions & Pressure Ratings

PVC PIPE

Schedule 40

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.	Maximum W.P. PSI*
1/8	0.405	0.249	0.068	0.051	810
1/4	0.540	0.344	0.088	0.086	780
3/8	0.675	0.473	0.091	0.115	620
1/2	0.840	0.602	0.109	0.170	600
3/4	1.050	0.804	0.113	0.226	480
1	1.315	1.029	0.133	0.333	450
1-1/4	1.660	1.360	0.140	0.450	370
1-1/2	1.900	1.590	0.145	0.537	330
2	2.375	2.047	0.154	0.720	280
2-1/2	2.875	2.445	0.203	1.136	300
3	3.500	3.042	0.216	1.488	260
3-1/2	4.000	3.521	0.226	1.789	240
4	4.500	3.998	0.237	2.118	220
5	5.563	5.016	0.258	2.874	190
6	6.625	6.031	0.280	3.733	180
8	8.625	7.942	0.322	5.619	160
10	10.750	9.976	0.365	7.966	140
12	12.750	11.889	0.406	10.534	130
14	14.000	13.073	0.437	12.462	130
16	16.000	14.940	0.500	16.286	130
18	18.000	16.809	0.562	20.587	130
20	20.000	18.743	0.593	24.183	120
24	24.000	22.544	0.687	33.652	120

SDR 13.5 - Class 315

Maximum W.P. 315 PSI* (all sizes)

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./ft.
1/2	0.840	0.716	.062	0.096
3/4	1.050	0.874	.078	0.168
1	1.315	1.101	.097	0.257
1-1/4	1.660	1.394	.123	0.403
1-1/2	1.900	1.598	.141	0.525
2	2.375	2.003	.176	0.809
2-1/2	2.875	2.423	.213	1.189
3	3.500	2.950	.259	1.762
4	4.500	3.794	.333	2.908
6	6.625	5.584	.491	6.313

SDR 21 - Class 200

Maximum W.P. 200 PSI* (all sizes)

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.
3/4	1.050	0.910	0.060	0.136
1	1.315	1.169	0.063	0.180
1-1/4	1.660	1.482	0.079	0.278
1-1/2	1.900	1.700	0.090	0.358
2	2.375	2.129	0.113	0.550
2-1/2	2.875	2.581	0.137	0.797
3	3.500	3.146	0.167	1.169
4	4.500	4.046	0.214	1.927
6	6.625	5.955	0.316	4.186
8	8.625	7.756	0.410	7.070
10	10.750	9.667	0.511	10.983
12	12.750	11.465	0.606	15.455
14	14.000	12.588	0.666	18.647
16	16.000	14.385	0.762	24.373
18	18.000	16.183	0.857	30.849
20	20.000	17.982	0.952	38.070
24	24.000	21.577	1.143	54.850

Schedule 80

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.	Maximum. W.P. PSI*
1/8	.405	.195	0.095	0.063	1230
1/4	.540	.282	0.119	0.105	1130
3/8	.675	.403	0.126	0.146	920
1/2	.840	.526	0.147	0.213	850
3/4	1.050	.722	0.154	0.289	690
1	1.315	.936	0.179	0.424	630
1-1/4	1.660	1.255	0.191	0.586	520
1-1/2	1.900	1.476	0.200	0.711	470
2	2.375	1.913	0.218	0.984	400
2-1/2	2.875	2.290	0.276	1.500	420
3	3.500	2.864	0.300	2.010	370
3-1/2	4.000	3.326	0.318	2.452	350
4	4.500	3.786	0.337	2.938	320
5	5.563	4.768	0.375	4.078	290
6	6.625	5.709	0.432	5.610	280
8	8.625	7.565	0.500	8.522	250
10	10.750	9.493	0.593	12.635	230
12	12.750	11.294	0.687	17.384	230
14	14.000	12.410	0.750	20.852	220
16	16.000	14.213	0.843	26.810	220
18	18.000	16.014	0.937	33.544	220
20	20.000	17.814	1.031	41.047	220
24	24.000	21.418	1.218	58.233	210

SDR 26 - Class 160

Maximum W.P. 160 PSI* (all sizes)

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.
1	1.315	1.175	0.060	0.173
1-1/4	1.660	1.512	0.064	0.233
1-1/2	1.900	1.734	0.073	0.300
2	2.375	2.173	0.091	0.456
2-1/2	2.875	2.635	0.110	0.657
3	3.500	3.210	0.135	0.967
4	4.500	4.134	0.173	1.570
6	6.625	6.084	0.255	3.415
8	8.625	7.921	0.332	5.786
10	10.750	9.874	0.413	8.973
12	12.750	11.711	0.490	12.623
14	14.000	12.860	0.538	15.209
16	16.000	14.696	0.615	19.881
18	18.000	16.533	0.692	25.162
20	20.000	18.370	0.769	31.064
24	24.000	22.043	0.923	44.754

SDR 41 - Class 100

Maximum W.P. 100 PSI* (all sizes)

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.
2-1/2	2.875	2.715	0.070	0.444
3	3.500	3.310	0.085	0.643
4	4.500	4.260	0.110	1.044
6	6.625	6.281	0.162	2.205
8	8.625	8.180	0.210	3.714
10	10.750	10.195	0.262	5.774
12	12.750	12.421	0.311	4.113
14	14.000	13.270	0.341	9.888
16	16.000	15.165	0.390	12.925
18	18.000	17.061	0.439	16.352
20	20.000	18.956	0.488	20.200
24	24.000	22.748	0.585	29.070

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas

See Spears® Product Sourcebook for product Offerings

Dimensions & Pressure Ratings

SDR 32.5 - Class 125
Maximum W.P. 125 PSI* (all sizes)

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.
1/2	.840	.750	.045	.071
3/4	1.050	0.950	0.050	0.099
1	1.315	1.215	0.051	0.126
1-1/4	1.660	1.520	0.060	0.221
1-1/2	1.900	1.760	0.060	0.255
2	2.375	2.209	0.073	0.378
2-1/2	2.875	2.679	0.088	0.541
3	3.500	3.264	0.108	0.793
4	4.500	4.204	0.138	1.280

SDR 32.5 - Class 125
Maximum W.P. 125 PSI* (all sizes)

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.
6	6.625	6.196	0.204	2.732
8	8.625	8.063	0.265	4.658
10	10.750	10.048	0.331	7.252
12	12.750	11.919	0.392	10.182
14	14.000	13.088	0.430	12.270
16	16.000	14.957	0.492	16.037
18	18.000	16.826	0.554	20.307
20	20.000	18.696	0.615	25.063
24	24.000	22.436	0.738	36.072

Schedule 120

Nom. Pipe Size (in)	O.D.	Average I.D.	Minimum Wall	Nominal Wt./Ft.	Maximum W.P. PSI*
1/2	.840	.480	0.170	0.236	1010
3/4	1.050	.690	0.170	0.311	770
1	1.315	.891	0.200	0.464	720
1-1/4	1.660	1.204	0.215	0.649	600
1-1/2	1.900	1.423	0.225	0.787	540
2	2.375	1.845	0.250	1.111	470

Schedule 120

Nom. Pipe Size (in)	O.D.	Average I.D.	Minimum Wall	Nominal Wt./Ft.	Maximum W.P. psi*
2-1/2"	2.875	2.239	0.300	1.615	470
3"	3.500	2.758	0.350	2.306	440
4"	4.500	3.574	0.437	3.713	430
6"	6.625	5.434	0.562	7.132	370
8"	8.625	7.189	0.718	11.277	380

CPVC INDUSTRIAL PIPE

Schedule 40

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./ft.	Maximum W.P. psi*
1/4	0.540	0.344	0.088	0.096	780
3/8	0.675	0.473	0.091	0.128	620
1/2	0.840	0.602	0.109	0.190	600
3/4	1.050	0.804	0.113	0.253	480
1	1.315	1.029	0.133	0.371	450
1-1/4	1.660	1.360	0.140	0.502	370
1-1/2	1.900	1.590	0.145	0.599	330
2	2.375	2.047	0.154	0.803	280
2-1/2	2.875	2.445	0.203	1.267	300
3	3.500	3.042	0.216	1.660	260
3-1/2	4.000	3.521	0.226	1.996	240
4	4.500	3.998	0.237	2.363	220
5	5.563	5.016	0.258	2.874	190
6	6.625	6.031	0.280	4.164	180
8	8.625	7.942	0.322	6.268	160
10	10.750	9.976	0.365	8.886	140
12	12.750	11.889	0.406	11.751	130
14	14.000	13.073	0.437	13.916	130
16	16.000	14.940	0.500	18.167	130
18	18.000	16.809	0.562	22.965	130
20	20.000	18.743	0.593	26.976	120
24	24.000	22.544	0.687	37.539	120

Schedule 80

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./ft.	Maximum W.P. psi*
1/4	0.540	0.282	0.119	0.117	1130
3/8	0.675	0.403	0.126	0.162	920
1/2	0.840	0.526	0.147	0.238	850
3/4	1.050	0.722	0.154	0.322	690
1	1.315	0.936	0.179	0.473	630
1-1/4	1.660	1.255	0.191	0.654	520
1-1/2	1.900	1.476	0.200	0.793	470
2	2.375	1.913	0.218	1.097	400
2-1/2	2.875	2.29	0.276	1.674	420
3	3.500	2.864	0.300	2.242	370
3-1/2	4.000	3.326	0.318	2.735	350
4	4.500	3.786	0.337	3.277	320
5	5.563	4.768	0.375	4.078	290
6	6.625	5.709	0.432	6.258	280
8	8.625	7.565	0.500	9.506	250
10	10.750	9.493	0.593	14.095	230
12	12.750	11.294	0.687	19.392	230
14	14.000	12.41	0.750	23.261	220
16	16.000	14.213	0.843	29.891	220
18	18.000	16.014	0.937	35.419	220
20	20.000	17.814	1.031	45.879	220
24	24.000	21.418	1.218	64.959	210

SDR 11 - Copper Tube Size (CTS)
Maximum W.P. 400 PSI* (all sizes)

Nominal Pipe Size (in)	Average O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.
1/2	0.625	0.469	0.068	0.080
3/4	0.875	0.695	0.080	0.149
1	1.125	0.901	0.102	0.240
1 1/4	1.375	1.105	0.125	0.353
1 1/2	1.625	1.309	0.148	0.489
2	2.125	1.716	0.193	0.829

SDR13.5 - Class 315
Maximum Working Pressure 315 psi (all sizes)

Nominal Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.
3/4	1.050	0.874	0.078	0.182
1	1.315	1.101	0.097	0.278
1-1/4	1.660	1.394	0.123	0.436
1-1/2	1.900	1.598	0.141	0.568
2	2.375	2.003	0.176	0.875
2-1/2	2.875	2.423	0.213	1.286
3	3.500	2.950	0.259	1.906
4	4.500	3.794	.333	3.146
6	6.625	5.584	.491	6.828

Note: *Pressure ratings are for water, non-shock, @73°F. Threaded pipe requires a 50% reduction in the pressure ratings stated for plain-end pipe @ 73°F. Threading recommended for Schedule 80 or heavier walls only. Maximum service temperature for PVC is 140°F. Maximum service temperature for CPVC is 200°F. The pressure rating of the pipe must be de-rated when working at elevated temperatures. Chemical resistance data should be referenced for proper material selection and possible de-rating when working with fluids other than water.

Temperature De-rating

The pressure ratings given are for water, non-shock, @ 73°F. The specified derating factors for PVC or for CPVC are suitable for pipe conveying water at elevated temperatures. To determine elevated temperature rating, multiply 73°F [23°C] pressure rating by appropriate factor shown in the tables.

When working near maximum specified temperature, solvent cement joints are recommended in place of threaded connections. Where disassembly is required at elevated temperatures use Spears® Special Reinforced (SR) adapters, flanges, unions or grooved coupling connections.

Only Schedule 80 or heavier wall thickness pipe (PVC or CPVC) should be threaded. Do NOT thread Schedule 40 pipe or other thinner-walled pipe such as SDR 13.5, SDR 21, SDR 26, etc. Threading requires a 50% reduction in the pipe's specified pressure rating @ 73°F.

See Chemical Resistance Data for Pressure Piping information for both chemical compatibility and potential temperature limitations when using certain chemicals.

PVC Pipe

Operating Temp (°F)	De-Rating Factor
73	1.00
80	0.88
90	0.75
100	0.62
110	0.51
120	0.40
130	0.31
140	0.22

EX: 2" PVC SCHEDULE 80 @ 120°F = 400 psi x 0.40 = 160 psi max. @ 120°F.

CPVC Pipe

Operating Temp (°F)	De-Rating Factor
73-80	1.00
90	0.91
100	0.82
110	0.72
120	0.65
130	0.57
140	0.50
150	0.42
160	0.40
170	0.29
180	0.25
200	0.20

EX: 2" CPVC SCHEDULE 80 @ 120°F = 400 psi x 0.65 = 260 psi max. @ 120°F