

Schedule 40 Pipe

Friction Loss Ft. Water / 100 Ft.

Velocity Ft. / Second

Gals. Per Min.	1/2"		3/4"		1"		1 1/4"		1 1/2"		2"		2 1/2"		3"	
	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss
1	1.13	2.08	0.63	0.51												
2	2.26	4.16	1.26	1.02	0.77	0.55	0.44	0.14	0.33	0.07						
5	5.64	23.44	3.16	5.73	1.93	1.72	1.11	0.44	0.81	0.22	0.49	0.066	0.30	0.038	0.22	0.015
7	7.90	43.06	4.43	10.52	2.72	3.17	1.55	0.81	1.13	0.38	0.69	0.11	0.49	0.051	0.31	0.021
10	11.28	82.02	6.32	20.04	3.86	6.02	2.21	1.55	1.62	0.72	0.98	0.21	0.68	0.09	0.44	0.03
15	4 in.		9.48	42.46	5.79	12.77	3.31	3.28	2.42	1.53	1.46	0.45	1.03	0.19	0.66	0.07
20	0.51	0.03	12.65	72.34	7.72	21.75	4.42	5.59	3.23	2.61	1.95	0.76	1.37	0.32	0.88	0.11
25	0.64	0.04	5 in.		9.65	32.88	5.52	8.45	4.04	3.95	2.44	1.15	1.71	0.49	1.10	0.17
30	0.77	0.06	0.49	0.02	11.58	46.08	6.63	11.85	4.85	5.53	2.93	1.62	2.05	0.68	1.33	0.23
35	0.89	0.08	0.57	0.03			7.73	15.76	5.66	7.36	3.41	2.15	2.39	0.91	1.55	0.31
40	1.02	0.11	0.65	0.03			8.84	20.18	6.47	9.43	3.90	2.75	2.73	1.16	1.77	0.40
45	1.15	0.13	0.73	0.04	6 in.		9.94	25.10	7.27	11.73	4.39	3.43	3.08	1.44	1.99	0.50
50	1.28	0.16	0.81	0.05	0.56	0.02	11.05	30.51	8.08	14.25	4.88	4.16	3.42	1.75	2.21	0.60
60	1.53	0.22	0.97	0.07	0.67	0.03			9.70	19.98	5.85	5.84	4.10	2.46	2.65	0.85
70	1.79	0.30	1.14	0.10	0.79	0.04					6.83	7.76	4.79	3.27	3.09	1.13
75	1.92	0.34	1.22	0.11	0.84	0.05					7.32	8.82	5.13	3.71	3.31	1.28
80	2.05	0.38	1.30	0.13	0.90	0.05					7.80	9.94	5.47	4.19	3.53	1.44
90	2.30	0.47	1.46	0.16	1.01	0.06	8 in.				8.78	12.37	6.15	5.21	3.98	1.80
100	2.56	0.58	1.62	0.19	1.12	0.08	0.65	0.03			9.75	15.03	6.84	6.33	4.42	2.18
125	3.20	0.88	2.03	0.29	1.41	0.12	0.81	0.035					8.55	9.58	5.52	3.31
150	3.84	1.22	2.44	0.40	1.69	0.16	0.97	0.04					10.26	13.41	6.63	4.63
175	4.48	1.63	2.84	0.54	1.97	0.22	1.14	0.055	10 in.						7.73	6.16
200	5.11	2.08	3.25	0.69	2.25	0.28	1.30	0.07	0.82	0.027					8.83	7.88
250	6.40	3.15	4.06	1.05	2.81	0.43	1.63	0.11	1.03	0.035					11.04	11.93
300	7.67	4.41	4.87	1.46	3.37	0.60	1.94	0.16	1.23	0.05	12 in.					
350	8.95	5.87	5.69	1.95	3.94	0.79	2.27	0.21	1.44	0.065	1.01	0.027				
400	10.23	7.52	6.50	2.49	4.49	1.01	2.59	0.27	1.64	0.09	1.16	0.04				
450			7.31	3.09	5.06	1.26	2.92	0.33	1.85	0.11	1.30	0.05				
500			8.12	3.76	5.62	1.53	3.24	0.40	2.05	0.13	1.45	0.06				
750							4.86	0.85	3.08	0.28	2.17	0.12				
1000							6.48	1.45	4.11	0.48	2.89	0.20				
1250									5.14	0.73	3.62	0.31				
1500									6.16	1.01	4.34	0.43				
2000											5.78	0.73				
2500											7.23	1.11				

NOTE: In larger diameters, particularly 6" and greater, it is recommended that velocities be maintained at or below 5 feet per second.

FRICION LOSS THROUGH FITTINGS

Friction loss through fittings is expressed in equivalent feet of the same pipe size and schedule for the system flow rate.

Schedule 40 head loss per 100' valves are usually used for other wall thicknesses and standard iron pipe size O.D.'s.

Average Friction Loss for PVC and CPVC Fittings in Equivalent Feet of Straight Run Pipe

Item	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24
Tee Run	1.0	1.4	1.7	2.3	2.7	4.0	4.9	6.1	7.9	12.3	14.0	17.5	20.0	25.0	27.0	32.0	35.0	42.0
Tee Branch	3.8	4.9	6.0	7.3	8.4	12.0	14.7	16.4	22.0	32.7	49.0	57.0	67.0	78.0	88.0	107.0	118.0	137.0
90° Ell	1.5	2.0	2.5	3.8	4.0	5.7	6.9	7.9	11.4	16.7	21.0	26.0	32.0	37.0	43.0	53.0	58.0	67.0
45° Ell	.8	1.1	1.4	1.8	2.1	2.6	3.1	4.0	5.1	8.0	10.6	13.5	15.5	18.0	20.0	23.0	25.0	30.0

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Schedule 80 Pipe

Friction Loss Ft. Water / 100 Ft.

Velocity Ft. / Second

Gals. Per Min.	1/2"		3/4"		1"		1 1/4"		1 1/2"		2"		2 1/2"		3"	
	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss	Vel	Loss
1	1.48	4.02	0.74	0.86												
2	2.95	8.03	1.57	1.72	0.94	0.88	0.52	0.21	0.38	0.10						
5	7.39	45.23	3.92	9.67	2.34	2.75	1.30	0.66	0.94	0.30	0.56	0.10	0.39	0.05	0.25	0.02
7	10.34	83.07	5.49	17.76	3.28	5.04	1.82	1.21	1.32	0.55	0.78	0.15	0.54	0.07	0.35	0.028
10			7.84	33.84	4.68	9.61	2.60	2.30	1.88	1.04	1.12	0.29	0.78	0.12	0.50	0.04
15	4 in.		11.76	71.70	7.01	20.36	3.90	4.87	2.81	2.20	1.68	0.62	1.17	0.26	0.75	0.09
20	0.57	0.04			9.35	34.68	5.20	8.30	3.75	3.75	2.23	1.06	1.56	0.44	1.00	0.15
25	0.72	0.06	5 in.		11.69	52.43	6.50	12.55	4.69	5.67	2.79	1.60	1.95	0.67	1.25	0.22
30	0.86	0.08	0.54	0.03	14.03	73.48	7.80	17.59	5.63	7.95	3.35	2.25	2.34	0.94	1.49	0.31
35	1.00	0.11	0.63	0.04			9.10	23.40	6.57	10.58	3.91	2.99	2.73	1.25	1.74	0.42
40	1.15	0.14	0.72	0.04			10.40	29.97	7.50	13.55	4.47	3.83	3.12	1.60	1.99	0.54
45	1.29	0.17	0.81	0.06	6 in.		11.70	37.27	8.44	16.85	5.03	4.76	3.51	1.99	2.24	0.67
50	1.43	0.21	0.90	0.07	0.63	0.03	13.00	45.30	9.38	20.48	5.58	5.79	3.90	2.42	2.49	0.81
60	1.72	0.30	1.08	0.10	0.75	0.04			11.26	28.70	6.70	8.12	4.68	3.39	2.99	1.14
70	2.01	0.39	1.26	0.13	0.88	0.05					7.82	10.80	5.46	4.51	3.49	1.51
75	2.15	0.45	1.35	0.14	0.94	0.06					8.38	12.27	5.85	5.12	3.74	1.72
80	2.29	0.50	1.44	0.16	1.00	0.07					8.93	13.83	6.24	5.77	3.99	1.94
90	2.58	0.63	1.62	0.20	1.13	0.08					10.05	17.20	7.02	7.18	4.48	2.41
100	2.87	0.76	1.80	0.24	1.25	0.10	8 in.				11.17	20.90	7.80	8.72	4.98	2.93
125	3.59	1.16	2.25	0.37	1.57	0.16	0.90	0.045					9.75	13.21	6.23	4.43
150	4.30	1.61	2.70	0.52	1.88	0.22	1.07	0.05					11.70	18.48	7.47	6.20
175	5.02	2.15	3.15	0.69	2.20	0.29	1.25	0.075	10 in.						8.72	8.26
200	5.73	2.75	3.60	0.88	2.51	0.37	1.43	0.09	0.90	0.036					9.97	10.57
250	7.16	4.16	4.50	1.34	3.14	0.56	1.79	0.14	1.14	0.045					12.46	16.00
300	8.60	5.83	5.40	1.87	3.76	0.78	2.14	0.20	1.36	0.07	12 in.					
350	10.03	7.76	6.30	2.49	4.39	1.04	2.50	0.27	1.59	0.085	1.12	0.037				
400	11.47	9.93	7.19	3.19	5.02	1.33	2.86	0.34	1.81	0.11	1.28	0.05				
450			8.09	3.97	5.64	1.65	3.21	0.42	2.04	0.14	1.44	0.06				
500			8.99	4.82	6.27	2.00	3.57	0.51	2.27	0.17	1.60	0.07				
750							5.36	1.08	3.40	0.36	2.40	0.15				
1000							7.14	1.84	4.54	0.61	3.20	0.26				
1250									5.67	0.92	4.01	0.40				
1500									6.80	1.29	4.81	0.55				
2000											6.41	0.94				
2500																

NOTE: In larger diameters, particularly 6" and greater, it is recommended that velocities be maintained at or below 5 feet per second.

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Tee Run	1.0	1.4	1.7	2.3	2.7	4.0	4.9	6.1	7.9	12.3	14.0	17.5	20.0	25.0	27.0	32.0	35.0	42.0
Tee Branch	3.8	4.9	6.0	7.3	8.4	12.0	14.7	16.4	22.0	32.7	49.0	57.0	67.0	78.0	88.0	107.0	118.0	137.0
90° Ell	1.5	2.0	2.5	3.8	4.0	5.7	6.9	7.9	11.4	16.7	21.0	26.0	32.0	37.0	43.0	53.0	58.0	67.0
45° Ell	.8	1.1	1.4	1.8	2.1	2.6	3.1	4.0	5.1	8.0	10.6	13.5	15.5	18.0	20.0	23.0	25.0	30.0

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