

Friction Of Water In Pipes

FRICITION HEAD IN FEET PER HUNDRED FEET OF PIPE. VELOCITY IN FEET PER SECOND. SCHEDULE 40 PIPE.

CAP. IN GPM	VEL. IN FPS	FRICT. HEAD FEET	CAP. IN GPM	VEL. IN FPS	FRICT. HEAD FEET	CAP. IN GPM	VEL. IN FPS	FRICT. HEAD FEET	CAP. IN GPM	VEL. IN FPS	FRICT. HEAD FEET
1-INCH PIPE			3-INCH PIPE			8-INCH PIPE			14-INCH PIPE (CONT.)		
4	1.48	1.295	15	.651	.0762	100	.641	.0224	3000	7.11	1.0400
6	2.23	2.680	30	1.300	.2620	150	.964	.0466	4000	9.48	1.81
8	2.97	4.540	50	2.170	.6620	200	1.280	.0780	5000	11.90	2.78
10	3.71	6.860	75	3.250	1.3900	400	2.570	.2790	6000	14.20	3.95
15	5.57	14.650	100	4.340	2.3900	600	3.850	.5970	7000	16.60	5.32
20	7.42	25.100	150	6.510	5.1400	800	5.130	1.0200			
30	11.10	54.600	175	7.600	6.9000	1000	6.410	1.5600	16-INCH PIPE		
40	14.80	95.000	200	8.680	8.9000	1200	7.700	2.2000	500	.908	.0193
			250	10.850	13.6500	1400	8.980	2.9500	750	1.360	.0405
1 1/4-INCH PIPE			300	13.000	19.2000	1600	10.300	3.8200	1000	1.820	.0683
5	1.073	.508	400	17.500	33.9000	1800	11.500	4.7900	1250	2.270	.1007
10	2.150	1.770				2100	13.450	6.4400	1500	2.720	.1450
20	4.290	6.340	4-INCH PIPE			2400	15.400	8.3100	2000	3.630	.2480
30	6.440	13.600	50	1.26	.176				2500	4.540	.3770
40	8.580	23.500	75	1.89	.370	10-INCH PIPE			3000	5.450	.5350
50	10.700	36.000	100	2.52	.624	100	.407	.0074	4000	7.260	.9210
60	12.900	51.000	125	3.15	.947	300	1.220	.0542	5000	9.080	1.1400
80	17.200	89.200	150	3.78	1.320	750	3.050	.2910	6000	10.900	2.0100
			200	5.04	2.270	1000	4.070	.5000	7000	12.700	2.6900
1 1/2-INCH PIPE			300	7.56	4.890	1250	5.090	.7600	8000	14.500	3.4900
5	0.788	.242	350	8.82	6.550	1500	6.100	1.0700	9000	16.300	4.3800
10	1.580	.824	400	10.10	8.470	1800	7.320	1.5200			
20	3.150	2.940	500	12.60	13.000	2100	8.550	2.0500	18-INCH PIPE		
30	4.730	6.260	600	15.10	18.600	2400	9.760	2.6400	750	1.08	.0228
40	6.300	10.790				2700	11.000	3.3200	1000	1.43	.0386
60	9.460	23.200	5-INCH PIPE			3000	12.200	4.0600	1250	1.79	.0585
80	12.600	40.500	50	.802	.0587	3400	13.800	5.1600	1500	2.16	.0819
100	15.800	62.200	75	1.200	.1223	3800	15.500	6.4000	1750	2.37	.0970
			100	1.600	.2040				2000	2.87	.1390
2-INCH PIPE			150	2.410	.4330	12-INCH PIPE			2500	3.59	.2110
10	.956	.248	200	3.210	.7360	100	.287	.0033	3000	4.30	.2970
20	1.910	.868	250	4.010	1.1200	250	.717	.0168	4000	5.74	.5110
30	2.870	1.820	300	4.810	1.5800	500	1.430	.0587	5000	7.17	.7810
40	3.820	3.100	400	6.410	2.7200	750	2.150	.1240	6000	8.61	1.1100
50	4.780	4.670	500	8.020	4.1600	1000	2.870	.2100	7000	10.00	1.4900
60	5.740	6.590	600	9.620	5.8800	1500	4.300	.4500	8000	11.50	1.9300
80	7.640	11.400	700	11.200	7.9300	2000	5.730	.7760	10000	14.30	2.9700
120	11.500	24.700	850	13.600	11.5000	2500	7.170	1.1860	12000	17.20	4.2100
160	15.300	43.100	1000	16.000	15.8000	3000	8.600	1.6800			
						3500	10.030	2.2500	20-INCH PIPE		
2 1/2-INCH PIPE			6-INCH PIPE			4000	11.500	2.9200	1000	1.15	.0227
15	1.01	.217	100	1.11	.0843	4500	12.900	3.6500	1250	1.56	.0399
30	2.01	.753	150	1.675	.1770	5000	14.300	4.4700	1500	1.74	.0480
50	3.35	1.940	200	2.200	.2990	5500	15.800	5.3800	1750	2.03	.0637
75	5.03	4.130	250	2.880	.4330				2000	2.31	.0812
100	6.70	7.110	300	3.330	.6370	14-INCH PIPE			2500	2.89	.1230
125	8.38	10.850	350	3.890	.8520	500	1.19	.0370	3000	3.46	.1740
150	10.05	15.400	400	4.440	1.0900	750	1.78	.0777	4000	4.62	.2980
175	12.45	20.250	500	5.550	1.6600	1000	2.37	.1310	5000	5.77	.4550
200	13.40	26.700	600	6.660	2.3400	1250	2.97	.2000	6000	6.92	.6450
225	15.05	33.670	750	8.330	3.5700	1500	3.56	.2810	8000	9.23	1.1100
			1000	11.100	6.1700	1750	4.15	.3750	10000	11.50	1.7000
			1250	13.950	9.4800	2000	4.74	.4830	12000	13.80	2.4400
			1500	16.700	13.5000	2500	5.93	.7380	14000	16.20	3.2900
									16000	18.50	4.2600

Note: No allowance has been made for age, differences in diameter, or any abnormal condition of interior surface. Any factor of safety must be estimated from the local conditions and the requirements of each particular installation.

ISO 9001-2008
CERTIFIED



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