Friction Loss in Pipe Fittings - Plastic Pipe, Schedule 40

(Continued)

Fitting	Condition	L_E/d	Friction Loss for Water in Terms of Equivalent Length of Straight Pipe - feet												
			Nominal Pipe Size, inch												
			6	8	10	12	14	16	18	20	24	30	32	34	36
			Actual Inside Pipe Diameter, inch												
			6.065	7.981	10.02	11.94	13.12	15.00	16.88	18.81	22.62	28.50	30.62	32.62	34.50
90° Standard Elbow	- - -	30	15.2	20.0	25.1	29.8	32.8	37.5	42.2	47.0	56.6	71.3	76.6	81.6	86.3
90° Long Radius Elbow	- - -	18	9.10	12.0	15.0	17.9	19.7	22.5	25.3	28.2	33.9	42.8	45.9	48.9	51.8
90° Sharp Elbow	- - -	60	30.3	39.9	50.1	59.7	65.6	75.0	84.4	94.1	113	143	153	163	173
90° Street Elbow	- - -	50	25.3	33.3	41.8	49.7	54.7	62.5	70.3	78.4	94.3	119	128	136	144
90° Sharp Corner Street Elbow	- - -	57	28.8	37.9	47.6	56.7	62.3	71.3	80.2	89.4	107	135	145	155	164
45° Standard Elbow	- - -	15	7.58	9.98	12.5	14.9	16.4	18.8	21.1	23.5	28.3	35.6	38.3	40.8	43.1
45° Street Elbow	- - -	26	13.1	17.3	21.7	25.9	28.4	32.5	36.6	40.8	49.0	61.8	66.4	70.7	74.8
90° Bends, Pipe Bends, Flanged Elbows, Butt-welded Elbows	r/d = 1	18	9.10	12.0	15.0	17.9	19.7	22.5	25.3	28.2	33.9	42.8	45.9	48.9	51.8
	r/d = 1-1/2	12	6.07	7.98	10.0	11.9	13.1	15.0	16.9	18.8	22.6	28.5	30.6	32.6	34.5
	r/d = 2	10	5.05	6.65	8.35	9.95	10.9	12.5	14.1	15.7	18.9	23.8	25.5	27.2	28.8
	r/d = 3	11	5.56	7.32	9.19	10.9	12.0	13.8	15.5	17.2	20.7	26.1	28.1	29.9	31.6
	r/d = 4	11	5.56	7.32	9.19	10.9	12.0	13.8	15.5	17.2	20.7	26.1	28.1	29.9	31.6
	r/d = 6	13	6.57	8.65	10.9	12.9	14.2	16.3	18.3	20.4	24.5	30.9	33.2	35.3	37.4
	r/d = 8	16	8.09	10.6	13.4	15.9	17.5	20.0	22.5	25.1	30.2	38.0	40.8	43.5	46.0
r/d = bend radius/ pipe diameter	r/d = 10	30	15.2	20.0	25.1	29.8	32.8	37.5	42.2	47.0	56.6	71.3	76.6	81.6	86.3
	r/d = 12	34	17.2	22.6	28.4	33.8	37.2	42.5	47.8	53.3	64.1	80.8	86.8	92.4	97.8
	r/d = 14	38	19.2	25.3	31.7	37.8	41.6	47.5	53.4	59.6	71.6	90.3	97.0	103	109
90° Bends, Pipe Bends, Flanged Elbows, Butt-welded Elbows	r/d = 16	42	21.2	27.9	35.1	41.8	45.9	52.5	59.1	65.8	79.2	99.8	107	114	121
	r/d = 18	45	22.7	29.9	37.6	44.8	49.2	56.3	63.3	70.5	84.8	107	115	122	129
	r/d = 20	50	25.3	33.3	41.8	49.7	54.7	62.5	70.3	78.4	94.3	119	128	136	144
Mitre Bends	a = 0°	2	1.01	1.33	1.67	1.99	2.19	2.50	2.81	3.14	3.77	4.75	5.10	5.44	5.75
	a = 15°	4	2.02	2.66	3.34	3.98	4.37	5.00	5.63	6.27	7.54	9.50	10.2	10.9	11.5
	a = 30°	8	4.04	5.32	6.68	7.96	8.75	10.0	11.3	12.5	15.1	19.0	20.4	21.7	23.0
	a = 45°	15	7.58	10.0	12.5	14.9	16.4	18.8	21.1	23.5	28.3	35.6	38.3	40.8	43.1
	a = 60°	27	13.6	18.0	22.5	26.9	29.5	33.8	38.0	42.3	50.9	64.1	68.9	73.4	77.6
	a = 75°	40	20.2	26.6	33.4	39.8	43.7	50.0	56.3	62.7	75.4	95.0	102	109	115
	a = 90°	60	30.3	39.9	50.1	59.7	65.6	75.0	84.4	94.1	113	143	153	163	173
	2-90°	20	10.1	13.3	16.7	19.9	21.9	25.0	28.1	31.4	37.7	47.5	51.0	54.4	57.5
	3-90°	15	7.6	10.0	12.5	14.9	16.4	18.8	21.1	23.5	28.3	35.6	38.3	40.8	43.1
180° Bend (Close Return Bend)	Small Radius	75	37.9	49.9	62.6	74.6	82.0	93.8	105	118	141	178	191	204	216
	Large Radius	50	25.3	33.3	41.8	49.7	54.7	62.5	70.3	78.4	94.3	119	128	136	144
Standard Tee	Thru Flow	20	10.1	13.3	16.7	19.9	21.9	25.0	28.1	31.4	37.7	47.5	51.0	54.4	57.5
	Branch Flow	60	30.3	39.9	50.1	59.7	65.6	75.0	84.4	94.1	113	143	153	163	173
Welding Tee	Forged	45	22.7	29.9	37.6	44.8	49.2	56.3	63.3	70.5	84.8	107	115	122	129
	Mitre	60	30.3	39.9	50.1	59.7	65.6	75.0	84.4	94.1	113	143	153	163	173
Angle Valve	Full Open	158	79.9	105	132	157	173	198	222	248	298	375	403	430	454
	Full Open - Disc	200	101	133	167	199	219	250	280	310	380	480	510	540	580