

Equivalent Lengths of Pipe Fittings and Valves

TYPE OF FITTING OR VALVE	LENGTHS IN FEET OF STANDARD PIPE																		
	Nominal Pipe Size in Inches																		
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8	10	12	14 O.D.	16 O.D.	18 O.D.	20 O.D.	24 O.D.	30 O.D.
Standard tee with entry or discharge through side	3.4	4.5	5.5	7.5	9.0	12	14	17	22	33	43	55	65	78	85	105	115	135	170
Standard elbow or run ⁽¹⁾ of tee reduced 1/2 ⁽²⁾	1.7	2.2	2.7	3.7	4.3	5.5	6.5	8	12	16	20	26	31	36	42	47	52	64	80
Medium sweep elbow or run ⁽¹⁾ of tee reduced 1/4 ⁽²⁾	1.3	1.8	2.3	3.0	3.7	4.6	5.4	6.8	9.0	14	18	22	26	30	35	40	43	55	67
Long sweep elbow or run ⁽¹⁾ of standard tee or butterfly valve	1	1.3	1.7	2.3	2.7	3.5	4.2	5.3	7	11	14	17	20	23	26	31	34	41	52
45° elbow	0.8	1.0	1.2	1.6	2.0	2.5	3.0	3.7	5.0	7.5	10	12	15	17	20	22	24	30	37
Close return bend	3.7	5.1	6.2	8.5	10	13	15	19	24	37	49	62	75	86	100	110	125	150	185
Globe valve, wide-open	0.6	22	27	40	43	45	65	82	120	170	240	290	340	400	440	500	550	680	850
Angle valve, wide-open	8.2	11	14	18	21	28	33	42	56	85	112	145	165	190	220	250	280	340	420
Swing check valve, wide-open	4.0	5.2	6.6	9.0	11	14	16	19	26	39	52	66	78	92	106	120	130	145	160
Gate valve, wide-open, or slight bushing reduction	0.4	0.5	0.6	.08	0.9	1.2	1.3	1.7	2.3	3.5	4.5	5.7	6.7	8.0	9.0	11	12	14	17

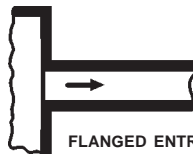
1. A fluid is said to flow through the run of a tee when the flow is straight through the tee with no change of direction.
2. A tee is said to be reduced 1/4 if the internal area of the smaller connecting pipe is 25% less than the internal area of the larger connecting pipe.



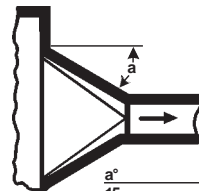
SHARP ENTRANCE
LOSS = 0.9 VP



MANIFOLD TAKE-OFF
LOSS = 0.7 VP



FLANGED ENTRANCE
LOSS = 0.5 VP



a°	LOSS
15	16 VP
30	17 VP
45	25 VP
60	35 VP