

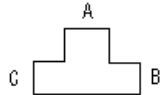
oliver m. dean, inc.

- hygienic process equipment
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Loss of Head Due to Friction in Feet per Foot of Stainless Steel Tubing and in Feet for Sanitary Fittings

Notes:

1. Flow Elbows—R/D = 1.5
2. Flow Through Tees—Flow A to B Port C capped off.
3. Test Medium—Water at 70°F
4. 16 gauge tubing was used for the measurements when the outer diameter (O.D.) was between 1" - 3" and 14 gauge tubing was used with the 4" O.D. measurement.



*Calculated data for estimating purposes only. Consult your tubing manufacturer with specific questions.

Capacity in U.S. G.P.M.	O.D. - 1"			O.D. - 1.5"			O.D. - 2"			O.D. - 2.5"			O.D. - 3"			O.D. - 4"		
	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee	Tubing	Elbow	Tee
2	.01	.01	.1															
4	.025	.02	.2															
5	.035	.025	.25															
10	.12	.06	.4	.02	.01	.15	.005	.015	.1									
15	.25	.1	.8	.04	.02	.25	.013	.02	.15									
20	.43	.22	1.5	.06	.03	.3	.02	.025	.2	.005	.02	.1	.003	.02	.06			
25	.66	.4	2.3	.08	.04	.4	.025	.03	.25	.006	.03	.15	.004	.03	.08			
30	.93	.7	3.3	.105	.06	.55	.035	.05	.3	.008	.05	.2	.005	.04	.1			
35	1.22	1.25	5.2	.135	.09	.8	.04	.06	.4	.011	.06	.25	.006	.05	.13			
40				.17	.11	1.0	.05	.08	.5	.015	.07	.3	.007	.06	.15			
45				.21	.16	1.3	.063	.1	.6	.02	.09	.35	.008	.065	.18			
50				.25	.2	1.6	.073	.12	.7	.022	.1	.4	.01	.07	.2			
60				.34	.35	2.2	.1	.18	.9	.03	.12	.45	.015	.08	.25			
80				.57	.76	3.7	.16	.3	1.5	.05	.15	.55	.02	.1	.4			
100				.85	1.35	5.8	.23	.44	2.3	.075	.18	.6	.03	.11	.5	.008	.04	.1
120				1.18	2.05	9.1	.32	.64	3.3	.105	.21	1.0	.04	.13	.6	.01	.05	.15
140							.42	.85	4.5	.14	.23	1.25	.05	.16	.8	.013	.06	.2
160							.54	1.13	5.8	.17	.28	1.6	.07	.2	1.1	.015	.07	2.5
180							.67	1.45	7.4	.205	.31	2.0	.08	.21	1.3	.02	.08	.3
200							.81	1.82	9.0	.245	.35	2.5	.1	.26	1.6	.025	.09	.4
220							.95	2.22	11.0	.29	.41	3.0	.12	.3	1.9	.028	.1	.5
240							1.10	2.63	13.5	.34	.48	3.7	.14	.33	2.2	.035	.11	.55
260										.39	.53	4.5	.165	.39	2.5	.04	.115	.6
280										.45	.61	5.3	.19	.42	2.8	.045	.12	.65
300										.515	.7	6.2	.22	.5	3.1	.05	.13	.7
350										.68	1.05	8.5	.28	.67	4.1	.07	.15	.9
400										.86	1.55	11.0	.36	.88	5.2	.085	.18	1.2
450										1.05	2.25	13.5	.44	1.1	6.6	.105	.2	1.5
500													.54	1.4	8.0	.13	.23	1.75
550													.64	1.7	9.5	.15	.27	2.1
600													.75	2.05	10.2	.175	.3	2.5
650													.87	2.41	13.0	.2	.34	2.8
700													1.0	2.8	15.0	.23	.4	3.4
750																.26	.43	3.8
800																.3	.5	4.4
850																.33	.56	5.0
900																.37	.62	5.7
950																.41	.7	6.3
1000																.45	.8	7.0
1100																.53	1.06	8.6

