

AIR INJECTION - OZONE INJECTION - CHEMICAL INJECTION
VACUUM GENERATION

ELMRIDGE "TLE" Series Liqui-Jet Gas & Chemical Infusers use water or other liquids as the motive fluid, and operate on the venturi principle to inject gases or other liquids into a pressurized liquid stream. Liqui-Jet Gas Infusers allow maximum gas or liquid injection with minimal differential pressure. Liquid is pumped through the Infuser nozzle, emerging at a relatively high velocity, creating a zone of lower pressure contained within the Suction Chamber of the Infuser. The secondary or Suction fluid (liquid, gas, or vapor), is drawn to this lower pressure zone, where the momentum of the motive liquid is transferred to the Suction fluid, causing the Suction fluid to be pumped. Operating characteristics (water motive/atmospheric air suction, and water motive/water suction), for standard models are shown below, and special units are also available to meet your specifications. Standard materials of construction are 316 Stainless Steel, PVC, CPVC, PVDF, and polypropylene. Other materials are available upon request. Threaded, flanged, sanitary, buttweld, or socket weld connections (except Cast Iron).



Table 1

**Suction Capacity (scfh free air) for a TLE5
Liqui-Jet Gas-Infuser using 70 deg. F Water**

Discharge Press. (psig)	Inlet Water Pressure (psig)									
	10	20	30	40	50	60	80	100	120	140
0	136	152	170	200	212	220	233	250	257	266
1	124	147	165	200	212	220	233	250	257	266
2	92	135	160	200	212	220	233	250	257	266
3	66	121	153	199	210	220	233	250	257	266
4	53	107	143	192	208	220	233	250	257	266
5	43	84	134	184	207	220	233	250	257	266
6	32	78	122	168	203	215	233	250	257	266
7	25	68	108	156	189	210	231	250	257	266
8	19	58	95	140	173	201	230	243	257	266
9	11	51	83	131	159	190	228	240	256	266
10	-	43	75	112	141	176	221	239	255	261
15	-	25	54	65	100	115	153	206	248	260
20	-	-	31	45	75	90	112	153	183	237
25	-	-	13	28	57	67	89	127	144	167
30	-	-	-	12	40	52	73	104	120	138
35	-	-	-	-	25	40	57	86	102	122
40	-	-	-	-	12	26	47	72	87	105
45	-	-	-	-	4	19	40	61	75	90
50	-	-	-	-	-	6	27	51	62	80
55	-	-	-	-	-	-	19	40	55	67
60	-	-	-	-	-	-	11	32	46	59
65	-	-	-	-	-	-	4	23	40	51
70	-	-	-	-	-	-	-	16	28	44
75	-	-	-	-	-	-	-	6	21	35
80	-	-	-	-	-	-	-	-	15	30
85	-	-	-	-	-	-	-	-	5	17
90	-	-	-	-	-	-	-	-	-	11
95	-	-	-	-	-	-	-	-	-	4
100	-	-	-	-	-	-	-	-	-	-
Motive Water Flowrate (usgpm)	25.5	34.8	42.5	47.3	52.5	57.3	65.3	72.7	78.9	85.0

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Table 2 Capacity Factors

Model	TLE00	TLE0	TLE1	TLE2	TLE3	TLE4	TLE5	TLE6	TLE7	TLE8	TLE9	TLE10	TLE11	TLE12	TLE13	TLE14
Capacity Factor	0.027	0.050	0.091	0.165	0.30	0.55	1.00	1.80	3.24	4.30	5.71	7.57	10.10	13.30	17.70	23.50

APPLICATION EXAMPLES

Table 3
Suction Capacity (usgpm water) for a TLE5
Liqui-Jet Infuser using 70 deg. F Water

EXAMPLE 1:

It is required that a minimum of 4 scfh of air be entrained into a line discharging 31 usgpm of water to a Discharge Pressure of 45 psig. The water can be supplied to the infuser at up to 60 psig.

- From Table TLE-1, the TLE5 infuser has a suction capacity of 19 scfh at 60 psig Motive Pressure and 45 psig Discharge Pressure. Motive Flowrate is 57.3 usgpm.

- The required Capacity Factor with respect to Motive Flowrate is:

$$31 / 57.3 = 0.541$$

- From the Capacity Factor Table TLE-2, the Capacity Factor of the TLE4 Infuser is 0.55, therefore, the Suction Capacity of the TLE4 at the given operating conditions is:

$$0.55 \times 19.0 = 10.45 \text{ scfh}$$

The Motive Flowrate of the TLE4 at the given operating conditions is:

$$0.55 \times 57.3 = 31.5 \text{ usgpm}$$

The Suction Flowrate can be reduced, if necessary, by throttling the suction air supply.

EXAMPLE 2:

It is required that 1 usgpm of chemical (S.G. = 1.0), be entrained into a line discharging 84 usgpm of water to a Discharge Pressure of 10 psig. Suction Lift is 5 feet. The water can be supplied to the infuser at up to 40 psig.

- From Table TLE-3, the TLE5 infuser has a suction capacity of 3.42 usgpm at 40 psig Motive Pressure, 5 feet Suction Lift, and 10 psig Discharge Pressure. Motive Flowrate is 50.4 usgpm.

- The required Capacity Factor with respect to Motive Flowrate is:

$$84 / 50.4 = 1.7$$

- From the Capacity Factor Table TLE-2, the Capacity Factor of the TLE6 Infuser is 1.80, therefore, the Suction Capacity of the TLE6 at the given operating conditions is:

$$1.80 \times 3.42 = 6.16 \text{ usgpm}$$

The Motive Flowrate of the TLE6 at the given operating conditions is:

$$1.80 \times 50.4 = 90.7 \text{ usgpm}$$

Motive and Suction Flowrates can be reduced by throttling the liquid streams as required.

Suction Lift (feet water)	Disch. Press. (psig)	Operating Water Pressure (psig)									
		10	20	30	40	50	60	80	100	120	
0	0	4.95	4.39	3.98	3.88	3.83	3.77	3.89	3.94	3.99	
	10	-	3.80	3.94	3.77	3.71	3.74	3.89	3.94	3.99	
	20	-	-	3.00	3.77	3.71	3.75	3.85	3.94	3.99	
	30	-	-	-	2.40	3.69	3.74	3.85	3.94	3.99	
	40	-	-	-	-	1.94	3.55	3.82	3.94	3.99	
	50	-	-	-	-	-	-	3.81	3.94	3.99	
	60	-	-	-	-	-	-	2.90	3.94	3.99	
	80	-	-	-	-	-	-	-	2.10	3.93	
	100	-	-	-	-	-	-	-	-	1.70	
	5	0	4.12	3.70	3.54	3.42	3.45	3.45	3.55	3.62	3.59
10		-	3.65	3.52	3.42	3.45	3.45	3.55	3.62	3.59	
20		-	-	2.95	3.40	3.45	3.45	3.55	3.62	3.59	
30		-	-	-	2.37	3.42	3.45	3.55	3.62	3.59	
40		-	-	-	-	1.72	3.40	3.55	3.62	3.59	
50		-	-	-	-	-	1.13	3.52	3.62	3.59	
60		-	-	-	-	-	-	2.86	3.62	3.59	
80		-	-	-	-	-	-	-	1.30	3.66	
100		-	-	-	-	-	-	-	-	0.90	
10		0	3.52	3.21	3.07	3.09	3.13	3.19	3.28	3.32	3.40
	10	-	3.19	3.07	3.09	3.13	3.19	3.28	3.32	3.40	
	20	-	-	2.63	3.05	3.13	3.19	3.28	3.32	3.40	
	30	-	-	-	1.89	3.09	3.18	3.28	3.32	3.40	
	40	-	-	-	-	-	3.04	3.28	3.32	3.40	
	50	-	-	-	-	-	-	3.26	3.32	3.40	
	60	-	-	-	-	-	-	2.58	3.31	3.38	
	80	-	-	-	-	-	-	-	1.44	3.35	
	100	-	-	-	-	-	-	-	-	1.36	
	15	0	2.85	2.70	2.70	2.76	2.82	2.87	2.91	3.00	3.05
10		-	2.68	2.70	2.76	2.82	2.87	2.91	3.00	3.05	
20		-	-	2.41	2.75	2.82	2.87	2.91	3.00	3.05	
30		-	-	-	2.07	2.80	2.87	2.91	3.00	3.05	
40		-	-	-	-	-	2.86	2.91	3.00	3.05	
50		-	-	-	-	-	-	2.91	3.00	3.05	
60		-	-	-	-	-	-	2.59	3.00	3.05	
80		-	-	-	-	-	-	-	1.65	3.02	
100		-	-	-	-	-	-	-	-	1.25	
20		0	2.26	2.28	2.34	2.40	2.47	2.50	2.56	2.58	2.66
	10	-	2.25	2.32	2.40	2.47	2.50	2.56	2.58	2.66	
	20	-	-	2.22	2.36	2.47	2.50	2.56	2.58	2.66	
	30	-	-	-	1.74	2.46	2.50	2.56	2.58	2.66	
	40	-	-	-	-	-	2.48	2.56	2.58	2.66	
	50	-	-	-	-	-	-	2.55	2.58	2.66	
	60	-	-	-	-	-	-	2.34	2.56	2.66	
	80	-	-	-	-	-	-	-	1.42	2.66	
	100	-	-	-	-	-	-	-	-	-	
	25	0	1.75	1.87	2.01	2.00	2.11	2.14	2.17	2.25	2.32
10		-	1.81	2.01	2.00	2.11	2.14	2.17	2.25	2.32	
20		-	-	1.87	2.00	2.11	2.14	2.17	2.25	2.32	
30		-	-	-	-	2.11	2.14	2.17	2.25	2.32	
40		-	-	-	-	-	2.14	2.17	2.25	2.32	
50		-	-	-	-	-	-	2.17	2.25	2.32	
60		-	-	-	-	-	-	2.07	2.25	2.32	
80		-	-	-	-	-	-	-	-	2.32	
100		-	-	-	-	-	-	-	-	-	
Power Water Consumption (USGPM)		29.7	38.2	44.9	50.4	56.2	60.5	68.8	75.6	81.8	

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