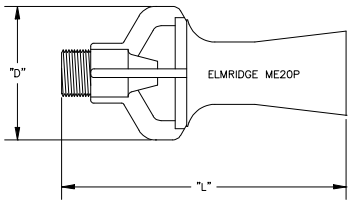
ELMRIDGE® Liqui-Jet® Mixing Eductors — ME Series

KEEPING SOLIDS IN SUSPENSION / DISPERSING CHEMICALS / MAINTAINING TANK CONCENTRATIONS / ELIMINATING THERMAL GRADIENTS

ELMRIDGE 'ME Series' Liqui-Jet Mixing Eductors vigorously and efficiently circulate the liquid contents of tanks without powered impellers or other insertion-type rotating mechanical devices. ELMRIDGE 'ME Series' Liqui-Jet Mixing Eductors operate on the same principle as our standard line of liquid-powered Jet-Apparatus. Liquid is pumped through the Eductor nozzle, emerging at a relatively high velocity, creating a localized zone of lower pressure. Tank contents are drawn to this lower pressure zone, where the momentum of the motive liquid is transferred to the tank liquid, causing the tank liquid to be 'pumped' and circulated. For every gallon of liquid pumped through the Eductor nozzle, up to five gallons of liquid is circulated. Note that Eductors can actually be 'aimed' at specific areas in the vessel. Operating characteristics (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 Glass Reinforced Polypropylene, PVDF, PVC, CPVC, Teflon®, Cast Iron, 316 Stainless Steel, Alloy 20, and Hastelloy C®. Other materials are available upon request. Threaded, flanged, or socket weld connections (except Cast Iron).

TANK MIXING



Dimensions

Model Number	Pressure Connection	D (inches)	L (inches)
ME05P	1/4" Male*	1-1/2"	3-1/8"
ME10P	3/8" Male*	2-1/8"	4-1/2"
ME20P	3/4" Male*	3"	6-3/8"
ME30P	1" Male*	3-13/16"	8-1/16"
ME40P	1-1/2" Male*	4-5/8"	9-7/8"
ME10M	3/8" Male*	1-3/4"	4-1/2"
ME20M	3/4" Male*	2-3/8"	6-3/4"
ME30M	1" Male*	2-7/8"	7-5/8"
ME40M	1-1/2" Male*	4-5/8"	9-7/8"
ME40	1-1/2" Female*	3-3/4"	9-1/2"
ME50	2" **	5-5/8"	12-1/4"
ME60	3" **	8-1/2"	17-5/8"
ME70	4" **	12-1/2"	26-1/4"
ME80	6" ***	17-1/4"	36-1/2"
ME90	8" ***	22"	48-5/8"

* NPT or BSPT

** NPT or BSPT Female or 150# ANSI FF Flange

*** 150# ANSI FF Flange only

Table 1 — Nozzle and Circulated Flow (usgpm) for ME Series Liqui-Jet Tank Mixing Eductors using 70 deg. F Water

Model Number	Flow Type	Operating Water Pressure (psi)								
		10	15	20	25	30	35	40	50	60
ME05P	Nozzle Flow	3.2	3.9	4.5	5.0	5.5	5.9	6.3	7.1	7.8
	Circ. Flow	16	20	23	25	28	30	32	36	39
ME10P	Nozzle Flow	7.5	9.2	10.6	11.9	13.0	14.0	15	17	18
	Circ. Flow	38	46	53	59	65	70	75	84	92
ME20P	Nozzle Flow	13.5	17	19	21	23	25	27	30	33
	Circ. Flow	68	83	95	107	117	126	135	151	165
ME30P	Nozzle Flow	20	24	28	32	35	37	40	45	49
	Circ. Flow	100	122	141	158	173	187	200	224	245
ME40P	Nozzle Flow	33	40	47	52	57	62	66	74	81
	Circ. Flow	165	202	233	261	286	309	330	369	404
ME10	Nozzle Flow	8.2	10	12	13	14	15	16	18	20
	Circ. Flow	33	40	46	52	57	61	66	73	80
ME20	Nozzle Flow	12	15	17	19	21	22	24	27	29
	Circ. Flow	48	59	68	76	83	90	96	107	118
ME30	Nozzle Flow	21	26	30	33	36	39	42	47	51
	Circ. Flow	84	103	119	133	145	157	168	188	206
ME40	Nozzle Flow	35	43	49	55	61	65	70	78	86
	Circ. Flow	140	171	198	221	242	262	280	313	343
ME50	Nozzle Flow	55	67	78	87	95	103	110	123	135
	Circ. Flow	275	337	389	435	476	514	550	615	674
ME60	Nozzle Flow	126	154	178	199	218	236	252	282	309
	Circ. Flow	630	772	891	996	1091	1179	1260	1409	1543
ME70	Nozzle Flow	285	349	403	451	494	533	570	637	698
	Circ. Flow	1425	1745	2015	2253	2468	2666	2850	3186	3491
ME80	Nozzle Flow	590	723	834	933	1022	1104	1180	1319	1445
	Circ. Flow	2950	3613	4172	4664	5110	5519	5900	6596	7226
ME90	Nozzle Flow	1062	1301	1502	1679	1839	1987	2124	2375	2601
	Circ. Flow	5310	6503	7509	8396	9197	9934	10620	11874	13007

APPLICATION EXAMPLES

EXAMPLE 1:

The volume of a rectangular process tank is 5,000 US gallons (approximately 10'W x 15'L x 4.5'H). In order that the contents of the tank remain in homogenous solution, it is necessary that the tank volume be completely turned over (ie. completely recirculated), in a period of approx. 8 minutes. It has further been determined that eductor spacing not exceed 3' in order to utilize the eductor outlet plume to further agitate the bottom corners of the tank. There is an existing single header of sufficient capacity centered longitudinally along the bottom of the tank, and a pump that will supply sufficient volume at 30 psig.

1. Four eductors spaced on 3' centers on each side of the header pipe will meet the necessary spacing requirements.

2. The number of eductors required is:

   4 x 2 sides = 8 eductors

3. Total required recirculation flowrate is:

   5000 / 8 min. = 625 usgpm

4. Required recirculation flowrate per eductor is:

   625 / 8 eductors = 78.1 usgpm

5. An ME20 eductor has a circulated flowrate of 83 usgpm at 30 psig., therefore a quantity of (8) ME20 eductors could be used.

6. The nozzle flow of an ME20 eductor at 30 psig is 21 usgpm, therefore, the pump must be able to supply:

   8 x 21 = 168 usgpm at 30 psig

EXAMPLE 2:

A steam-jacketed hot oil (S.G. = 1.21), preheat tank is 20' high and 10' in diameter (approx. 11750 usgal). It is desired that a single eductor using a portion of the total oil inflow turn over the contents of the tank in approx. 12 minutes in order to reduce temperature gradients within the tank. Pump pressure must also be approximated; assume inflow rate is sufficient.

1. The static discharge pressure that the pump must overcome is:

   20 x 1.21 = 24.2 feet of water
   = 10.5 psig

2. Total required recirculation flowrate is:

   11750 / 12 = 979 usgpm

4 An ME60 eductor has a circulated flowrate of 1091 usgpm at 30 psig, however, the pump must be sized to supply the ME60 nozzle flowrate of 218 x SQRT(1/1.21) = 198 usgpm at:

   30 + 10.5 = 40.5 psig