

# Industry Standard Eductor



# Typical Layouts for Tank Mixing Eductors

## Mixing



Cylindrical Tanks



Spherical Tanks



Elongated Tanks

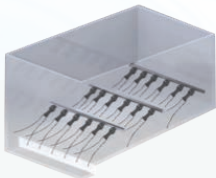


Rectangular and Square Tanks



Stratified Layers Tanks

## Directional Sweeping

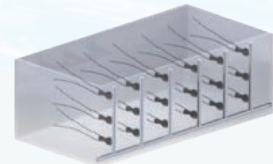


Electrocoat Tanks

## Tank Agitation

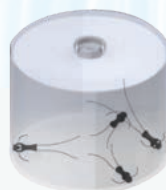


Parts Cleaning Tank



Rack Plating Tank

## Keeping Solids in Suspension

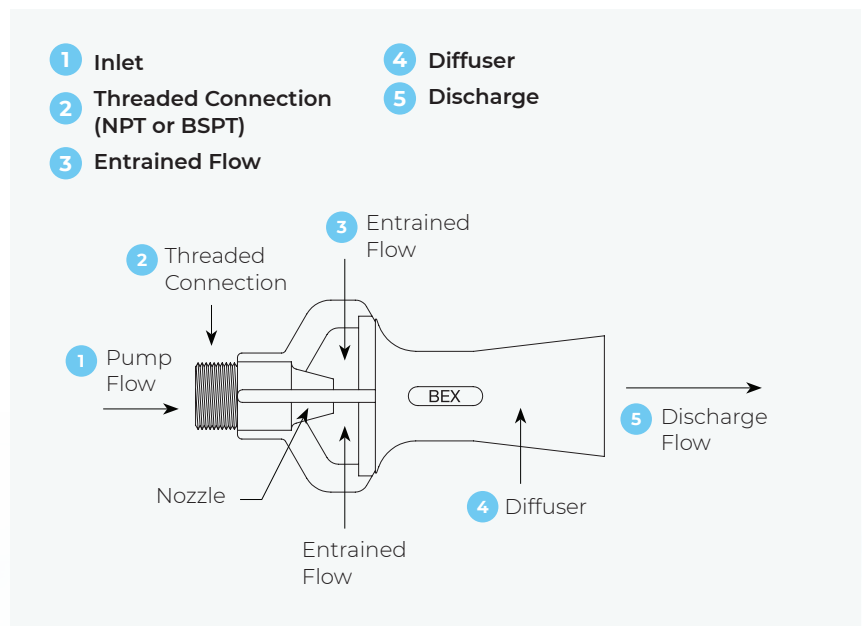


# What is an Eductor?

Tank mixing eductors are used to keep the contents of a tank mixed. They're typically connected to a recirculating pump, submersed in the contents of the tank.

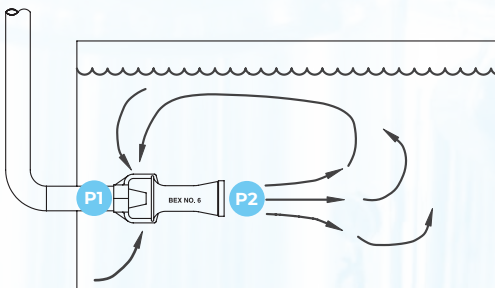
- Eductors can also be used to sweep debris or sludge toward an intake filter, suspending solids and adjusting pH levels.
- BEX eductors use a unique venturi design which enables smaller pumps to circulate large volumes of tank solution. The eductor will circulate 4 to 5 gallons of solution for each gallon pumped, resulting in quiet, efficient mixing.
- Eductors can also be used to heat the contents of a tank by injecting steam.
- They are available in both NPT and BSPT versions, larger models with female threads.
- Eductors are available in Polypropylene, PVDF, 316SS, Alloy 20, Cast Iron and some models PVC.

## Parts diagram



## Sparging

### Using BEX Eductors as steam spargers



#### Applications:

BEX Steam Spargers heat water and other liquids quickly and efficiently by direct injection of steam. They are designed for tank immersion and eliminate water hammer noise.

## Selecting the right Eductor:

- Calculate the required steam flow rate from the following equation:  
$$\text{Steam Rate (LB/HR)} = \frac{\text{Temp. increase of water (°F)} \times \text{weight of water (lbs.)}}{\text{Time allowed to heat tank (hrs.)} \times 1000}$$
- Knowing the steam flow rate and the steam pressure available at the sparger, choose the sparger(s) from the table below. Using several small spargers may be advisable to using one large sparger.
- To help eliminate steam hammer, ensure that the absolute pressure at the eductor entrance (P1) is at least twice the absolute pressure inside the tank at eductor depth (P2).

Model #	Max. Free Passage (in)	Steam Capacities (lbs/hr) at Various Pressures (psi)							
		20 psi	30 psi	40 psi	60 psi	80 psi	100 psi	120 psi	150 psi
T0M	0.288	136	175	214	293	371	450	528	646
T2M	0.386	212	273	334	456	579	701	823	1006
T3M	0.481	352	453	555	758	861	1164	1366	1671
T4M	0.612	590	760	930	1270	1610	1950	2290	2800
T5	0.781	896	1154	1412	1929	2445	2962	3478	4253
T6	1.188	1975	2544	3113	4525	5390	6528	7667	9374

#### Note:

1 Imperial gallon of water = 10.00 lbs.  
1 cubic foot of water = 62.40lbs.

1 U.S. gallon water = 8.33 lbs.  
1 litre of water = 2.20 lbs.

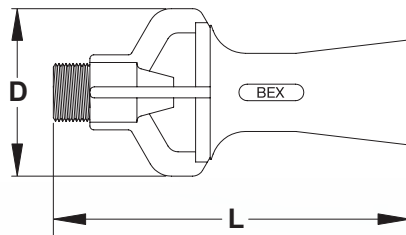


# TMP Plastic Eductors

## Eductor Circulation Ratio of supply to discharge is 1:5

The capacity table provides the flow of water through the eductor orifice. To determine total discharge, multiply this value by five (5).

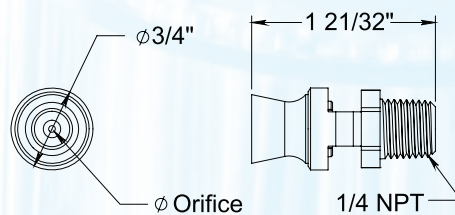
### Molded Plastic Models



Model #	Pipe Size	Dim. L	Dim. D
<b>T00MP</b>	¼ NPT Male	3 ⅞	1 ½
<b>T0MP</b>	⅜ NPT Male	4 ½	2 ⅛
<b>T2MP</b>	¾ NPT Male	6 ⅜	3
<b>T3MP</b>	1 NPT Male	8 ½	3 ¾
<b>T4MP</b>	1 ½ NPT Male	9 ⅞	4 ⅝

Model #	Max. Free Passage (in)	Capacities at Various Pressuers (USGPM)							
		10 psi	15 psi	20 psi	25 psi	30 psi	35 psi	40 psi	50 psi
<b>T00MP</b>	0.188	3.2	3.9	4.5	5.0	5.5	5.9	6.3	7.1
<b>T0MP</b>	0.288	7.5	9.2	10.6	11.9	13.0	14.0	15.0	16.8
<b>T2MP</b>	0.386	13.5	16.5	19.1	21.0	23.0	25.0	27.0	30.0
<b>T3MP</b>	0.481	21.0	26.0	30.0	33	36	39	42	47
<b>T4MP</b>	0.612	33	40	47	52	57	62	66	74

### Mini Plastic Models



Model #	Max. Free Passage (in)	Color	Nozzle Flow (GPM) At Various Pressures (psi)							
			10 psi	15 psi	20 psi	25 psi	30 psi	40 psi	50 psi	Ent Ratio
<b>TMMP6</b>	0.059	Red	0.31	0.38	0.43	0.48	0.53	0.61	0.68	4.7
<b>TMMP11</b>	0.079	Green	0.55	0.67	0.78	0.87	0.95	1.10	1.23	3.7
<b>TMMP18</b>	0.098	Blue	0.90	1.10	1.27	1.42	1.56	1.80	2.01	2.2
<b>TMMP26</b>	0.118	Yellow	1.30	1.59	1.84	2.06	2.25	2.60	2.91	1.6

# Cast Eductors



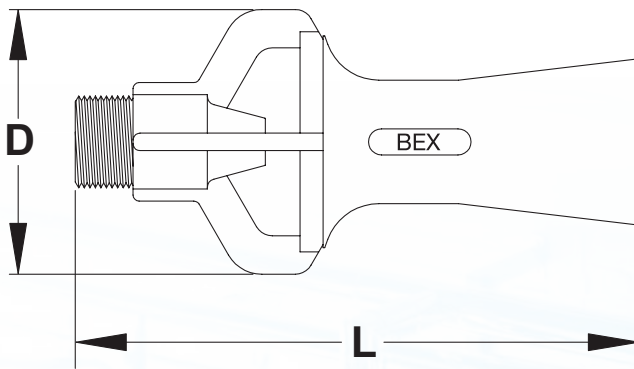
316SS Cast Eductor



Cast Iron Eductor

## Eductors are found in many different industries.

Health & Beauty (Chemical processing), Oil & Gas (Petroleum processing), water & sewage treatment (aerating), fisheries (aerating), electrocoating (mixing), Galvanizing (dip tank agitation), paint production (blending), Cooling towers (debris sweeping), even amusement parks (decorative fountains).



Model #	Pipe Size	Dim. L	Dim. D
T0M	3/8 NPT Male	4 1/2	2 1/8
T2M	3/4 NPT Male	6 3/8	3
T22M	3/4 NPT Male	6 3/8	3
T3M	1 NPT Male	8 1/2	3 3/4
T4M	1 1/2 NPT Male	9 7/8	4 5/8
T5	2" NPT Female	12 1/4	4 7/8
T6	3" NPT Female	17 1/8	7 1/2

Model #	Max. Free Passage (in)	Capacities at Various Pressuers (USGPM)							
		10 psi	15 psi	20 psi	25 psi	30 psi	35 psi	40 psi	50 psi
T0M	0.288	7.5	9.2	10.6	11.9	13.0	14.0	15.0	16.8
T2M	0.39	13.5	16.5	19.1	21.0	23.0	25.0	27.0	30.0
T22M	0.42	16.1	19.7	22.8	25.0	27.0	30.0	32	36
T3M	0.48	21.0	26.0	30.0	33	36	39	42	47
T4M	0.61	33	40	47	52	57	62	66	74
T5	0.78	55	67	78	87	95	103	110	123
T6	1.19	126	154	178	199	218	236	252	282

## Sizing

Eductor sizing calculations are based on the number of turns required to achieve the desired mixing or agitation in a tank. A turn is defined as a volume equal to the tank volume passing through the **discharge** of the eductor.

### Example:

One 6000 gallon tank with four eductors. To accomplish one turn, 6000 gallons have to pass through the discharges.

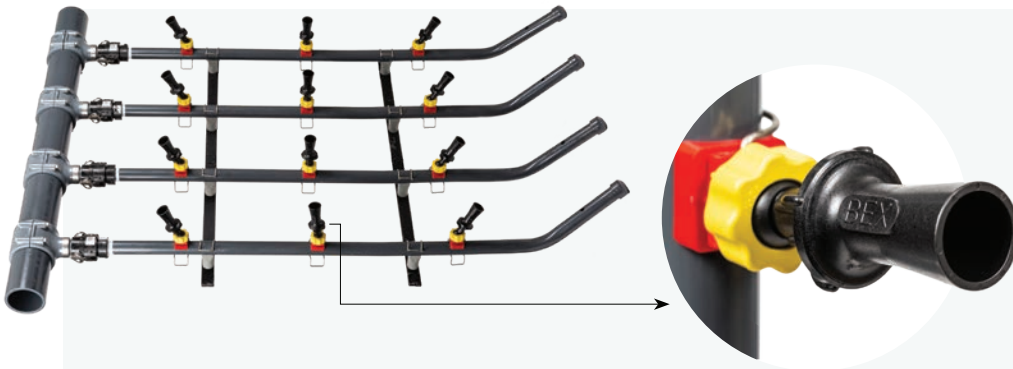
$$100 \text{ gal/min. eductor} \times 60 \text{ min/hour} \times 4 \text{ eductors} = 24000 \text{ gal/hour}$$

$$\text{Number of tank turnovers} = 24000 \text{ gal/hour} \div 6000 \text{ gal/turn} = 4 \text{ turns/hour}$$

Typical range of many applications is 10-30 turns per hour. BEX does not design tanks or specify suitable ranges for turnover requirement.

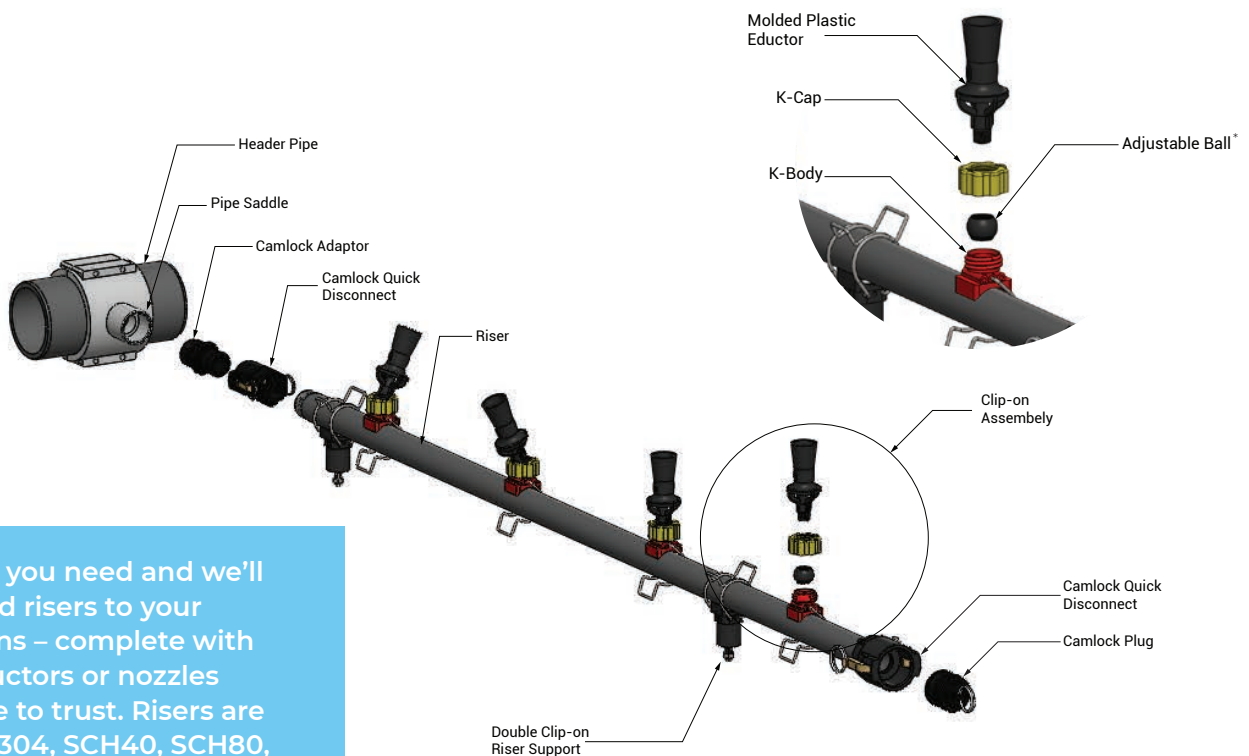
# BEX Eductors

## K-System Riser Assemblies



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\*BEX adjustable balls are compatible with Molded Plastic Models T00MP, T0MP, and all Mini Plastic Models.



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