JACOBY·TARBOX®
A Division Of The Clark·Reliance Corporation
Over 80 years of Quality!

Tank Liquid Agitator (TLA)

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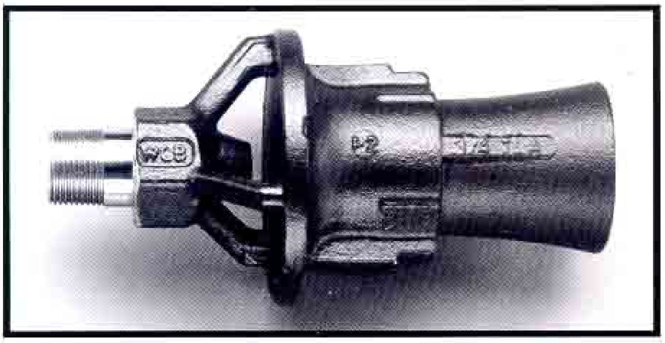
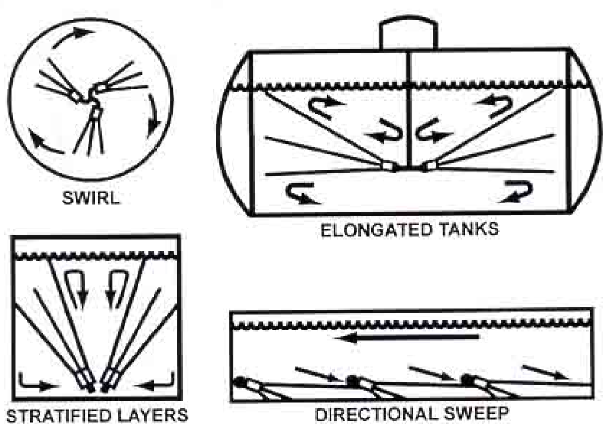


The Jacoby·Tarbox® Tank Liquid Agitator (JT TLA) is an eductor designed for "in-tank" applications. The **TLA** operates on the principle of flow dynamics. Pressurized fluid is accelerated through the nozzle to become a high velocity stream that entrains tank contents and intimately mixes with them. This combined stream exits the **TLA** at a high velocity creating a flow field capable of causing additional agitation and mixing the tank contents.

The **TLA's** motive fluid may come from two sources. The tank liquid may be recirculated through the eductor via an external pump or a secondary fluid may be introduced into the tank. Gases, as well as liquids, are used as the secondary fluid. Aeration and gas dispersion for chemical reactions are common uses of gas motive systems. Liquids are typically additives to be mixed with or to dilute the tank contents. **TLA's** are often used in heating applications where the motive fluid is generally steam.

Typical Arrangement of Eductors for Tank Agitation & Mixing



Tank Liquid Agitator (TLA) Features:

- Computer optimized flow paths enable the **JT TLA** to maintain a high "pick-up ratio" (the ratio of fluid entrained to the motive fluid) while maximizing the hydraulic efficiency (the ratio of hydraulic power at the outlet of the **TLA** to the hydraulic power at the inlet) to generate an optimum flow field from the greatest flow amplification.
- Optimum flow field enables more activity within the tank than competitive units without changing pumps.
- The **TLA** can be used in a wide variety of open vessels or closed tanks.
- Compact design and ease of mounting keeps the **TLA** from interfering with other tank equipment.
- "In-tank" mounting eliminates need for costly, complex mounting structures above tanks.
- No moving parts in the eductor, minimizing maintenance expenses.
- Eliminates stratification and promotes a homogenous tank with relation to pH, temperature, solids or gas dispersion, and distribution of chemicals.
- Produces a unique agitation not available with other types of mixers, as the **TLA** can generate a directed flow field within the fluid being mixed including viscous fluids, slurries, and suspensions.
- Easily mixes liquids of differing specific gravities and is excellent for scrubbing applications where a lower specific gravity fluid is driven into the higher one.
- Flow amplification due to high "pick-up ratio" and hydraulic efficiency permits the use of smaller pumps, which translates to reduced costs of mixing or agitation.
- Reduces investment cost because existing transfer pumps can be utilized for more than one purpose.
- Excellent for heating tank contents in steam applications.

CALCULATING TURNOVER RATES

- When turnover rates are used to calculate mixing, it is important to consider the viscosity of the fluid and the amounts of solids present, the size and weight of the shapes of tanks which limit the free flow of the mixing solids to maintain suspension, the viscosity or odd flow field within the tank, and suspensions that separate easily and demand constant mixing. In most cases, the **TLA** will usually provide a homogenous mixture of the vessel in one to three turnovers.

- When operated with pressure drops between 10 and 60 PSI, the **TLA** will entrain at least **4** times as much tank liquid as the motive liquid used. For pressure drops over 60 PSI, the amount of fluid entrained by the **TLA** remains almost constant.

- To calculate the required turnover time for the tank with pressure drops between 10 and 60 PSI, divide the tank volume by the result of the number of eductors times the outlet flow (GPM).

DETERMINING EFFECTIVE FLOW FIELDS FOR MIXING IN TANKS

- To properly size a **TLA** eductor for mixing a tank, the effective length of the flow field must be determined. The amount of power put into the tank varies based on the mass flow rate of the motivating fluid in the eductor and the pressure of the fluid as it enters the system.

- For vessels mixed at an angle, the distance the eductor is actually seeing must be calculated. For example, if the eductor is angled upward, the distance is the hypotenuse of the triangle made up of the length and the height of the tank.

- Refer to the "Max Length" listed in the chart below for determining the normal effective length of the **TLA** eductor. At this length, the minimum velocity centerline within the flow field is normally one foot per second. Beyond this length, the lower velocities may have limited effect on the tank contents.

Size IPS	*Sizing Factor*		*Pressure Difference, PSI*											
			10	*20*	*30*	*40*	*50*	*60*	*70*	*80*	*90*	*100*	*120*	*140*
3/8	0.23	Inlet Flow	7.1	10.0	12.3	14.2	15.8	17.4	18.7	20.1	21.3	22.4	24.6	26.5
		Outlet Flow	35	50	61	71	79	87	88	90	91	92	94	96
		Max. Length	4	8	12	16	22	29	36	43	50	58	72	86
3/4	0.50	Inlet Flow	15.4	21.8	26.7	30.8	34.5	37.8	40.8	43.6	46.3	48.8	53.4	57.7
		Outlet Flow	77	109	134	154	172	189	192	195	197	200	204	209
		Max. Length	5	11	17	24	33	42	53	64	74	85	106	127
1 1/2	1.00	Inlet Flow	30.8	43.6	53.4	61.6	68.9	75.5	81.5	87.2	92.5	97.5	107	115
		Outlet Flow	154	218	267	306	345	378	384	389	395	400	409	417
		Max. Length	7.5	16	24	34	46	60	75	90	105	120	150	180
2	2.00	Inlet Flow	61.6	87.2	107	123	138	151	163	174	185	195	214	231
		Outlet Flow	308	436	534	616	689	755	767	778	789	799	818	835
		Max. Length	11	23	34	48	65	85	106	127	148	170	212	255
3	4.60	Inlet Flow	142	201	246	283	317	347	375	401	426	449	491	531
		Outlet Flow	708	1,003	1,228	1,417	1,585	1,737	1,764	1,790	1,815	1,836	1,880	1,920
		Max. Length	16	34	51	73	99	129	161	193	225	257	322	386

SPECIFICATIONS

- Standard materials **TLA's** are cast or fabricated in: bronze, 316 stainless and carbon steel. Cast units range from IPS 3/4 to 3. Larger sizes and other materials are fabricated. Consult the factory for details.

- Standard body connection for 3/8 and 3/4 units is male NPT and for 1 1/2 through 3, female NPT. Optional connections include female/male NPT, butt weld, socket weld, Victualic™ sil-braze, and flanged.

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