



Parkson VariOxTM Jet Aeration

The VariOxTM jet aeration system is an aeration and mixing device used in numerous water and wastewater treatment applications. Jet aeration combines many of the benefits and efficiencies of both mechanical and diffused air type systems. The jet aerator consists of an inner liquid nozzle and an outer air nozzle. Liquid from the basin is re-circulated through a jet motive pump and discharged through the inner liquid nozzle at a high velocity. Concurrently, air is fed into the outer air nozzle where it is mixed with the motive liquid and discharged as a high energy jet plume.

The cross flow of motive liquid through the air entering the outer nozzle creates a shearing action which generates a medium to fine air bubble. The air bubbles are entrained within the jet plume and discharged in a horizontal plane into the lower portions of the basin.

The jets can be operated with or without air being fed through the outer air nozzle. This provides the functionality of both a mixed and an aeration device. Air rates can also be varied through the outer nozzle which provides the ability to maintain a complete mix condition while adjusting air rates to satisfy process requirements.

Jet Aeration Systems Are Ideal For:

- BNR/ENR applications
- Covered tanks
- Deep basins
- Sequencing batch reactors
- Oxidation ditches
- Equalization basins
- Aerobic digesters

The efficiency of the jet system is comparable to fine bubble diffuser systems. The main benefit is that, unlike membrane diffusers, the jets do not lose efficiency over time. Oxygen transfer efficiencies remain constant over the life of the equipment. This is a key advantage when considering both the long term operating cost and the operational sustainability since no scheduled down time for equipment replacement is required.

The motive liquid used to deliver oxygen provides a highly turbulent environment which results in a high alpha value, similar to mechanical type aerators. Alpha values of 0.85 are commonly used for typical municipal wastewater. The jets produce a medium to fine air bubble which is delivered in a high velocity horizontal flow pattern. This flow pattern provides a longer bubble residence time versus standard diffuser designs that create only a vertical path of air bubble travel.

Screening of the raw wastewater is generally provided in most applications. Parkson recommends that screens be sized with openings <1/2" (12 mm). Two methods are available to flush out the jet nozzles- pumped flushout and pneumatic flushout.

Pumped Flushout

The pumped flushout nozzle cleaning system utilizes the jet motive pump in conjunction with a crossover pipe and valve arrangement. The pipe and valve arrangement is configured to allow the pump to take suction from the jet manifold, creating a reverse flow path of liquid through the nozzle. This high velocity reverse flow will dislodge any potential fouling material within the nozzles. The liquid is discharged back into the basin.

Pneumatic Flushout

The pneumatic flushout system uses air from the blower to create an air lift to move water in a reverse direction through the nozzle assembly. With the jet pump turned off, air from the blower moves from the outer nozzle into the inner liquid nozzle and accumulates inside the liquid line. When the flushout valve is opened, air moves up a riser pipe which creates an air lift pump so that liquid is pulled through the nozzle in a reverse direction, freeing any fouling material from the nozzle.



Fort Lauderdale
Chicago
Kansas City
Dubai

1.888.PARKSON
technology@parkson.com
www.parkson.com

