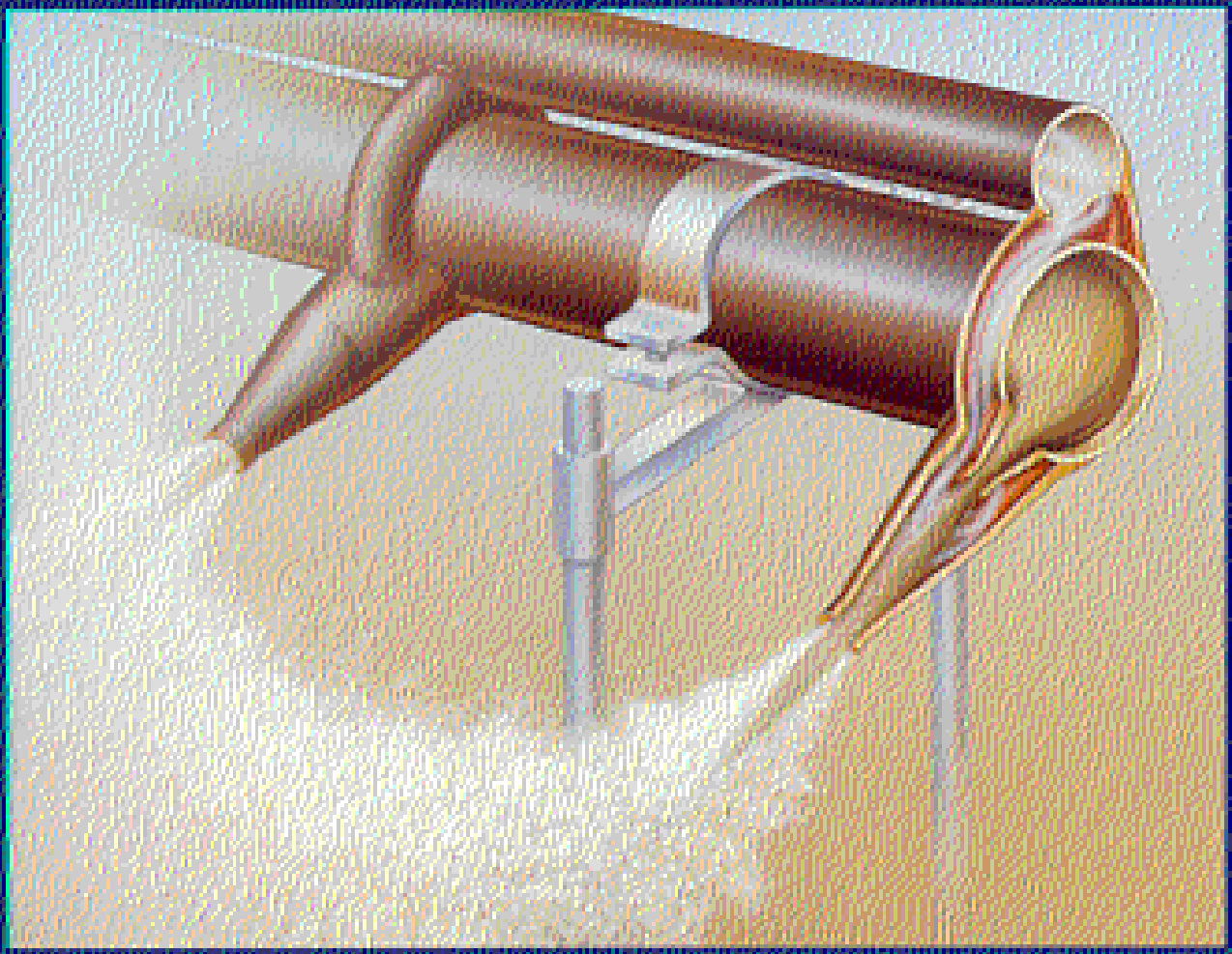


USFilter

Taking care of the world's water

JET TECH VARI-CANT® JET AERATION SYSTEMS

JET AERATION HISTORY

Jet aerators or educators have been utilized for gas/liquid contacting and mixing for over one hundred years. Over the past three decades, jet aeration has become widely accepted, and increasingly popular in wastewater treatment technology.

The Vari-Cant® jet aeration system developed by USFilter's Jet Tech Products group utilizes proven principles of jet aeration, combined with state-of-the-art design and materials, resulting in a system with superior performance, efficiency and trouble-free operation.

OPERATING PRINCIPALS

Submerged jet aeration intermixes air with a motive liquid and injects the stream into the wastewater. The aerator itself consists of two jet nozzles. The motive liquid - recirculated mixed liquor - is discharged from an inner nozzle into an outer mixing nozzle, within which compressed atmospheric air is introduced, and sheared into tiny bubbles which are entrained in the motive liquid stream.

As the stream is discharged into the surrounding mixed liquor, it forms a highly turbulent jet plume. The plume entrains the surrounding mixed liquor and brings it into contact with the tiny air bubbles. The resultant oxygen transfer rate is extremely high. This efficiency is due to the high air/waste interface area created by the miniscule bubbles, the turbulence within the jet plume, and the extended bubble residence time.

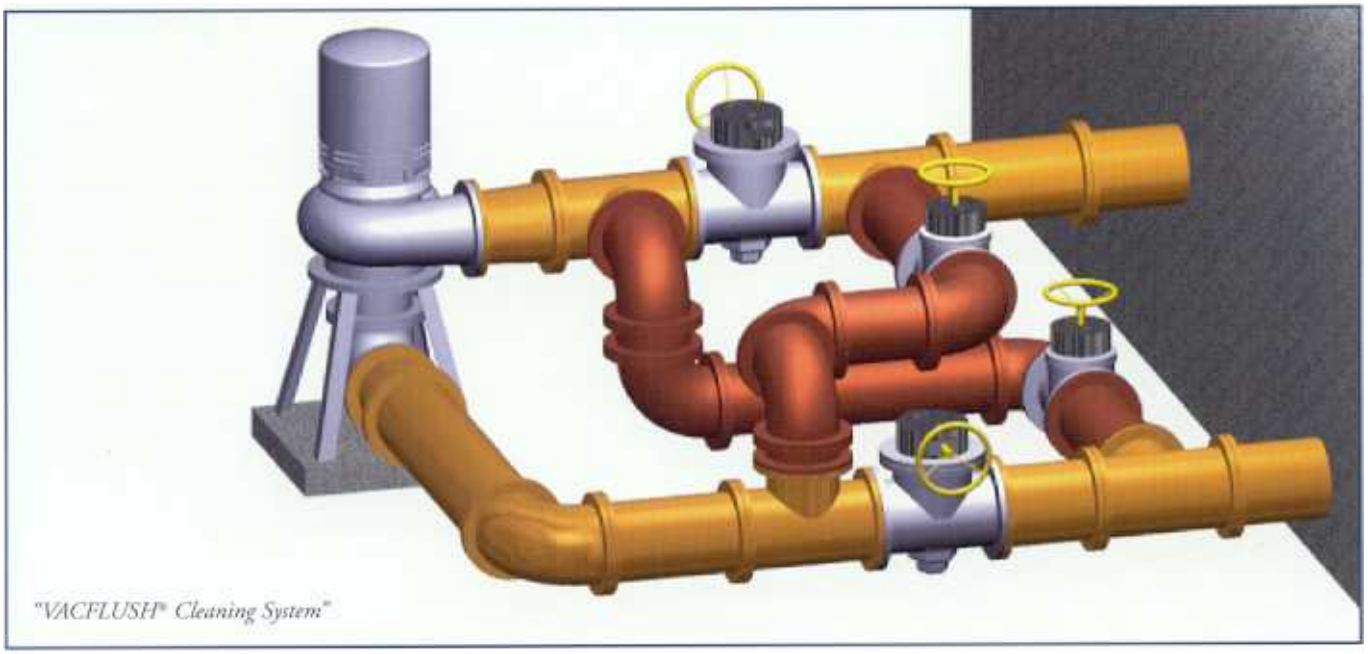
VARI-CANT® JET AERATION

Submerged jet aeration systems have traditionally been designed with their nozzles discharging horizontally, usually no more than one foot off the reactor basin floor. Consequently, air blowers are required to operate against a static pressure nearly equal to the basin's total depth.

Vari-Cant® Jet Aeration Systems are designed to be mounted higher, usually 2 ½ to 4 feet above the basin floor. By mounting the Vari-Cant® nozzles at this higher level, significant savings in blower horsepower can be realized, thus cutting power costs.

Vari-Cant® nozzles do not discharge horizontally, like traditional systems, but at a downward angle of 15 to 30 degrees, depending on basin geometry. This downward cant drives the bubbles as much as 2 ½ feet deeper than their discharge depth. Full scale tap water oxygen transfer tests have shown the transfer efficiency achieved by the Vari-Cant® system, operating at a depth of 11 feet and a 30° cant, to be greater than a horizontal system at a depth of 13.6 feet in an EPA study. Results such as these are typical. In most applications, a Vari-Cant® system is superior in performance compared to horizontal systems mounted two feet deeper in the reactor basin.

At the Galey & Lord Textile WWTP in Society Hill, SC the average flow is 7.7MGD utilizing (3) 125ft. x 32ft. Aeration Tanks for jet aeration and (3) 110ft. x 32ft. Equalization Tanks for jet mixing.



"VACFLUSH® Cleaning System"

JET AERATION SYSTEM CLEANING

In some applications, jet nozzles can become plugged.

If clogging occurs, efficiency and cost effectiveness drop. As the inner jet nozzles become blocked, the jet aerator loses its ability to produce the small bubbles necessary for optimum efficiency. When this occurs, the jet can lose as much as 50% of its efficiency, and is reduced to the performance level of a "coarse bubble" diffuser.

To assure high efficiency, positive effective cleaning is mandatory.

VACFLUSH® CLEANING SYSTEM

Vacflush® is a proprietary piping and valving arrangement which uses the powerful suction of the jet motive pump to positively clean any debris from the jet nozzles. This is done by simply reversing flow through the jets. It takes only minutes, requires no tank draining, nor removal of equipment. Vacflush® is the most reliable cleaning system available today, and is recommended for any application utilizing dry pit pumps with large debris and minimal pretreatment.

MULTIFLO® CLEANING SYSTEM

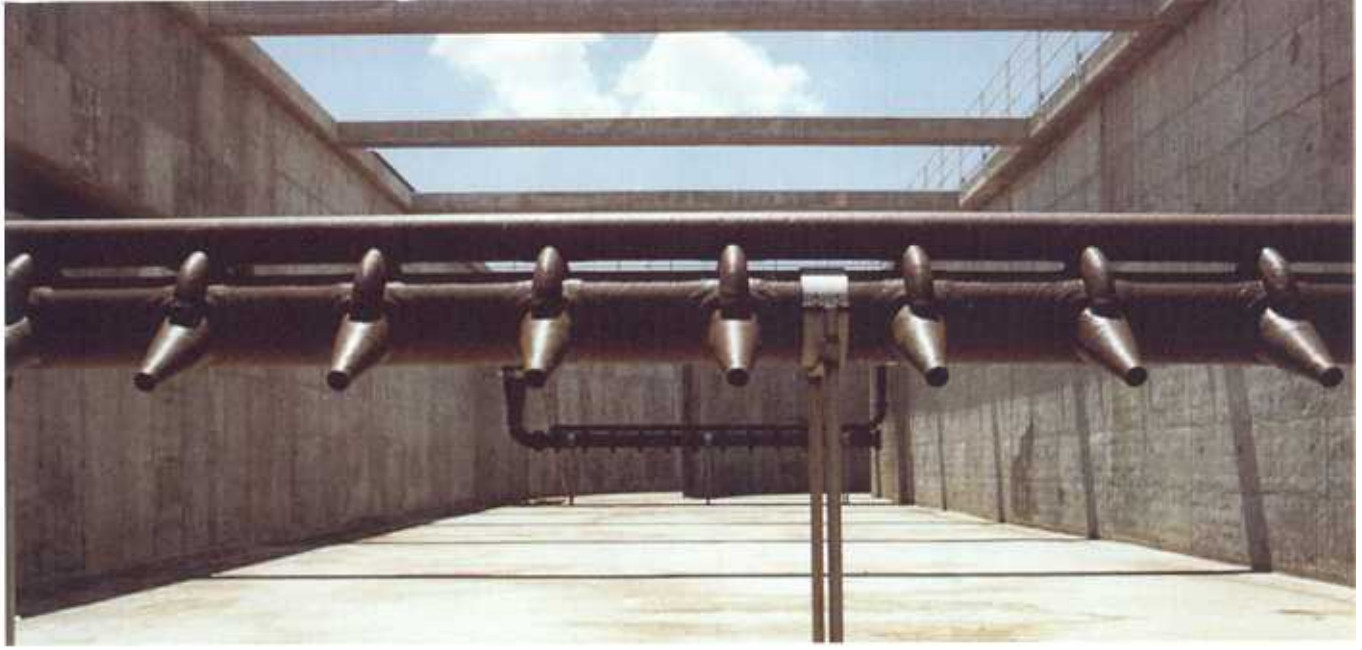
The proprietary MULTIFLO® cleaning system utilizes a submersible propeller pump. This pump is installed in an open bottom MULTIFLO® pump column located in the basin. In this arrangement, the aeration system is backflushed by operating the pump in revese rotation.

PNEUMATIC BACKFLUSH SYSTEM

This is recommended for small systems, or systems utilizing submersible motive liquid pumps.

Whichever cleaning system is used, the results are effective, positive cleaning action, consistently high efficiency, and years of trouble free operation.

Pneumatic Backflush cleaning system.



Vari-Cant® aeration systems provide efficient oxygen transfer, unmatched mixing, and up to 100% turndown while maintaining mixing. There are no moving parts in the basins with dry pit pumps, so O & M is easy and minimal.

PROVEN EFFECTIVE SELF-CLEANING

Vari-Cant® cleaning systems ensure long-term efficiency with minimal maintenance. The patented Vacflush® system provides up to 10 times more cleaning force than conventional cleaning methods, and is easily automated.

FREEDOM FROM MAINTENANCE

Cleaning systems eliminate the need for draining the basin and manually cleaning jets. This saves time, labor, money – and improves cost effectiveness.

HIGHEST QUALITY MATERIALS AND WORKMANSHIP

Jet Tech equipment is designed and fabricated of the highest quality fiberglass (FRP) available for maximum strength and corrosion resistance. Other materials are available upon request to meet job specifications. All Jet Tech equipment is built, tested, and inspected to the highest quality standards.

LOWER ENERGY COSTS

The system uses less energy than any comparable gas/liquid contacting system. Compared with Coarse bubble diffused aeration systems, Jet Tech equipment can result in energy savings of up to 50%.

PUBLISHED STUDIES SHOW THAT...

Fine bubble diffusers can lose as much as 50% of their "clean water" oxygen transfer efficiency when operating in wastewater. The excellent mixing and high turbulence created by the Vari-Cant® jet aerator assure high transfer efficiencies in all types of wastewater.

APPLICATIONS

- Biological Nutrient Removal Processes
- Oxidation Ditches
- Equalization Basins
- Sequencing Batch Reactors
- "ATAD" Autothermal Thermophilic Aerobic Digestion
- Retrofits
- Covered Tanks
- Cold Climate Applications

PRIMARY MARKETS

- Municipal
- Food & Beverage
- Pulp & Paper
- Petrochemical & Oil Refining
- Pharmaceutical
- Chemical/CPI
- Landfill/Leachate Applications
- Textile Industry

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