

# **Rotamix**<sup>®</sup>

**PROCESS MIXING SYSTEMS**



 **Vaughan**<sup>®</sup>  
Unmatched Reliability



**PRODUCT BROCHURE**

The Vaughan Rotamix® System is today's most cost-effective means of mechanical hydraulic mixing, consisting of an engineered arrangement of nozzles fed by a Vaughan® Chopper Pump. Using custom engineering software, each application is analyzed and sized by Vaughan to achieve the desired mixing effect. The Rotamix® System may be applied in circular, rectangular, oval tanks, basins, and other unique process configurations such as egg-shaped digesters, CSO tunnels, and pump stations.

## The Concept

The Rotamix® System incorporates several basic principles of physics and hydraulics, thus creating induced flow from the high velocity nozzles and increased surface contact from the Vaughan Chopper Pump - the heart of the system. When combined, this velocity based mixing system optimizes solids and bacteria contact while creating an even distribution of mixing energy.

## Multi-Zone Mixing

- Multiple discharge points produce uniform mixing velocity
- Flexible nozzle placement allows for mixing of any tank geometry
- Operates without liquid level dependency
- Volume and geometry determine number and placement of assemblies

## Surface Contact

- Reduced solids size from Vaughan Chopper Pump enhances solids contact with helpful bacteria
- Increased VSR (Volatile Solids Reduction) results in increased gas production
- In sludge tanks this results in more even-feed and dewatering

## Why Choose Rotamix

- Experience from over 6,000 systems installed worldwide
- Vaughan's UNMATCHED RELIABILITY and expertise as a solids handling specialist since 1960
- Engineering support using state of the art CFD software
- Operational flexibility through the use of VFD
- Chopping action continuously conditions and reduces solids size, promoting biological contact for improved volatile solids reduction
- Mix multiple tanks with one pump
- Provide mixing and transfer with one pump
- No access walkways, platforms or hoists required
- Continued Service and Support

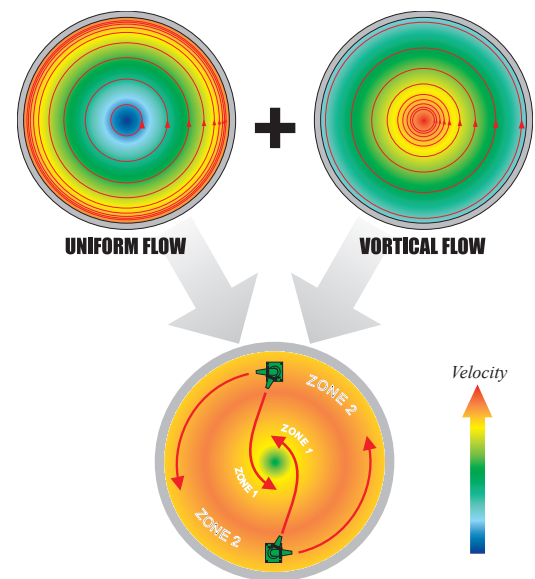


Figure 1 - Dual-rotational zones

## Rotamix® Mixing Assemblies

- Offered in single, double, and triple nozzle configurations
- Designed for permanent fixed installation - no moving parts in the tank
- 1" thick ductile iron, glass lined nozzle barrels protect against effects of abrasion, corrosion, and struvite formation
- All mixing assembly components are glass lined with a hardness greater than 5 on the Mohs' scale
- Exterior coated with Fusion Bonded Epoxy
- Mixing assemblies include a 10-year full warranty
- Stainless steel and cast poly materials (available for corrosive applications)
- Customized assemblies for smaller tanks in FOG, septage, and high-strength waste applications



Rotamix Nozzle

## Vaughan® Chopper Pumps

- Patented chopping design eliminates nozzle clogging
- Wear parts heat treated to 60+ Rockwell C Hardness extends pump life
- Oversized shaft and bearings extends pump life
- Heavy duty "flushless" mechanical seal (other seal designs available) assures leak-free operation
- Back pull-out design allows adjustment of all cutting clearances without disconnecting suction or discharge piping



## Available Chopper Pump Configurations

Pumps are available in configurations to fit site specific applications:

- Horizontal or Pedestal end suction
- Submersible (with available recirculation/transfer feature)
- Self Primer
- Vertical Wet Well (with available recirculation/transfer feature)



Chopper Pump

## Wastewater

- Acid Phase Digesters
- Anaerobic Digesters
- Anoxic Zones
- Bio-Solids
- CSO Tunnels
- Egg Shaped Digesters
- Equalization Basins
- FOG Reception & Blend Tanks
- High-Strength Waste (HSW) / Food Waste
- Influent Channels
- Municipal Biowaste/Codigestion
- Pump Stations
- Septage Receiving Tanks
- Skimmings & Wasting Pits
- Sludge Blend / TWAS Tanks
- Sludge Storage Tanks
- Thermal Hydrolysis Process Digestion



## Water

- Alum Sludges
- Ground Water Storage
- Lime Slurry Storage
- Screen Backwash Basins



## Industrial

- Anaerobic Digesters
- Biogas
- Biowaste / Renewable Energy / Organics Recycling
- Mining Fine Solids Suspension
- Pulp & Paper Black Liquor
- Refinery Waste Containment, API Sludges
- Textile Waste





# BIOGAS

## Turning Organic Waste to Renewable Energy

As energy costs rise and landfill restrictions increase, Vaughan stands ready to support the advancements of the biogas industry. Renewable energy resources will continue to play a vital role in reducing GHG emissions while creating effective alternatives to traditional energy resources. Whether manure digesters, or co-digestion of High Strength Wastes (HSW) like Fats, Oils, & Grease (FOG), Vaughan Rotamix® is the solution to providing effective and efficient mixing.

### Proven Feedstocks:

- Livestock Manure
- Poultry Manure
- Food Waste
- FOG
- Brewery Waste
- Silage Waste
- Crop Co-digestion
- Fertilizer
- Hydrolysis
- Depackaged Waste
- Septage
- Municipal Sludge

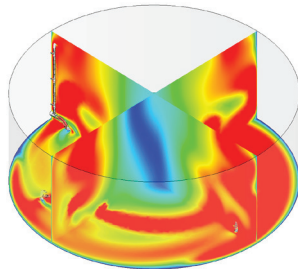


## COMPUTATIONAL FLUID DYNAMIC (CFD) ANALYSIS

Since 2001, thousands of computer flow simulations have been generated and evaluated in-house for wastewater and bio-solids systems. Analyses are based on specific customer requirements and sludge rheology. Vaughan® Company CFD Analysis includes velocity field mapping, along with tracer burst and washout testing simulation for digesters, providing accurate modeling of active volume. Our CFD analysis can provide piece of mind that your process will perform before shovels hit the dirt.

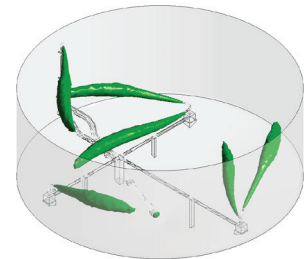
### VELOCITY PLOTS

Shown as cross sections, quadrants displayed indicate evenly distributed mixing energy throughout the tank.



### ISO SURFACE PLOTS

Illustrate the effects of the high velocity nozzle plumes as they drive tank mixing. Dual nozzles provide multiple discharge points to create even mixing.



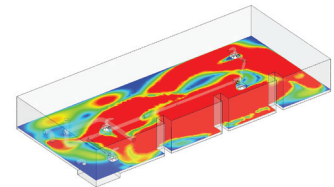
### Other Geometries

We can model ALL geometries, including steep-cone digesters and rectangular basins. Some geometries may require additional mixing energy to meet process mixing requirements, meaning conventional mixing systems may leave your process underperforming. Vaughan Rotamix will always provide mixing to meet your unique needs.

### STEEP CONED & EGG SHAPED DIGESTERS



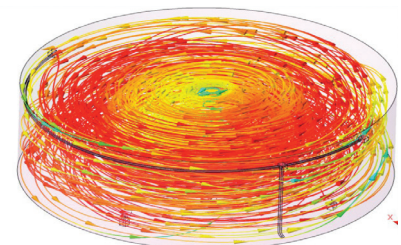
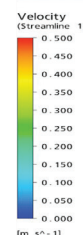
### RECTANGULAR TANKS



## VARIABLE FREQUENCY DRIVE (VFD)

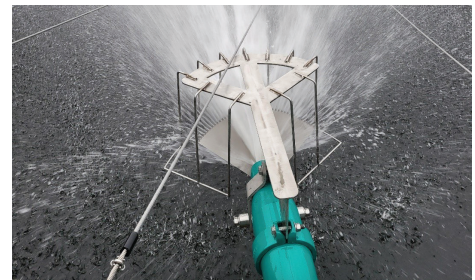
A VFD can maximize energy efficiency without sacrificing system performance. As nozzle flow is varied, so is the amount of energy transfer to the fluid. By using a VFD to operate the chopper pump, an operator can regulate the mixing energy. In doing so, significant savings can be achieved. However, it's ultimately the operator who will determine the ideal operating schedule for their facility and process.

- Provides system flexibility
- Fine tune mixing energy to current process conditions
- Digester applications can see up to 50% reduction in energy costs
- Not applicable to all processes
- VFD must be constant torque



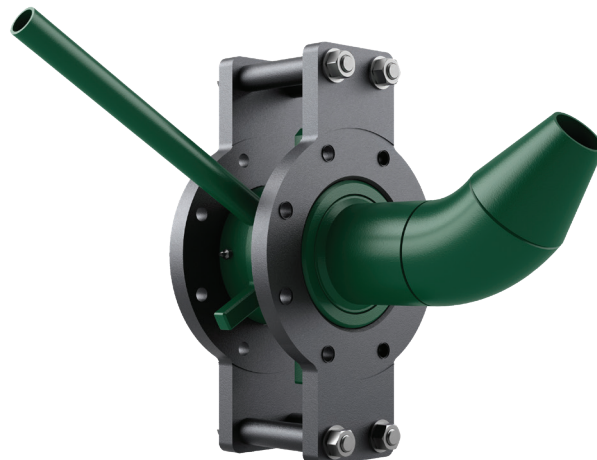
## FOAMBUSTER / FOAM SUPPRESSION SYSTEM

- The patented Foambuster combines Rotamix glass-lined ductile iron nozzles with a stainless steel splashplate to deflect the nozzle discharge and create a broad spray of sludge, which suppresses foam forming on the surface of the digester. The Foambuster can be operated using either the Rotamix System Chopper Pump or by a separate Vaughan Chopper Pump.
- For tanks without a Rotamix System, single or multiple Foambusters driven by a Vaughan Chopper Pump can be installed for surface foam suppression.



## EXTERNALLY MOUNTED ADJUSTABLE NOZZLES FOR SMALL TANK MIXING

- Designed to mix small (under 30ft Dia.) reactor vessels, sludge storage, and industrial process tanks
- 360° range of motion provides operational flexibility
- Nozzles mount in your tank with penetration flange
- No tank entry is required for installation





# Vaughan®

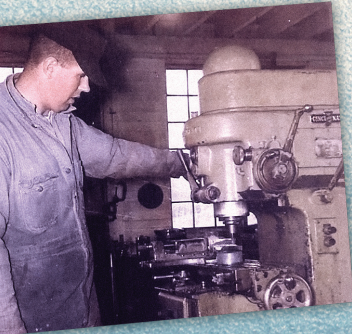
Unmatched Reliability

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In the late 1950s, Jim Vaughan saw a need to help local Washington state farmers resolve clogged manure pumps. A true innovator at heart, Jim pushed beyond expectations to help his neighbors by inventing the world's first chopper pump. Now, since 1960, Vaughan Company remains committed to giving customers outstanding service and the most dependable product solutions in the world.

To maintain our position as the industry leader, Vaughan Company consistently asks the same question as our founder: "What could make this better?" Using innovative technology like our in-house, 3D computer modeling, we create exacting fits and precision castings for all components. We also meet with customers on a consistent basis to understand and resolve the latest issues in water management. The more we ask and innovate, the better we solve the challenges facing engineers and technicians across the globe.

While we have sales and support available worldwide, Vaughan Company remains "Made in America." All of our products are manufactured in the U.S., in our 140,000 sq. ft. Washington state manufacturing facility. We encourage both potential and current customers to reach out to us for details on eligibility for federal aid programs as well as to arrange plant tours.



## Learn more about each of our products at [ChopperPumps.com](http://ChopperPumps.com)

### VAUGHAN® Chopper Pumps

Wet Wells, Dry Wells, Submersibles,  
Self-Primers, Recirculators



### ROTAMIX® Process Mixing System

Tank and Digester Mixing



### TRITON® Screw Centrifugal Pumps

Wet Wells, Dry Wells, Submersibles



### Also Available

Floating Pumps, Mixers, Auger  
Choppers, Vortex Choppers,  
Produce Disposal Choppers



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