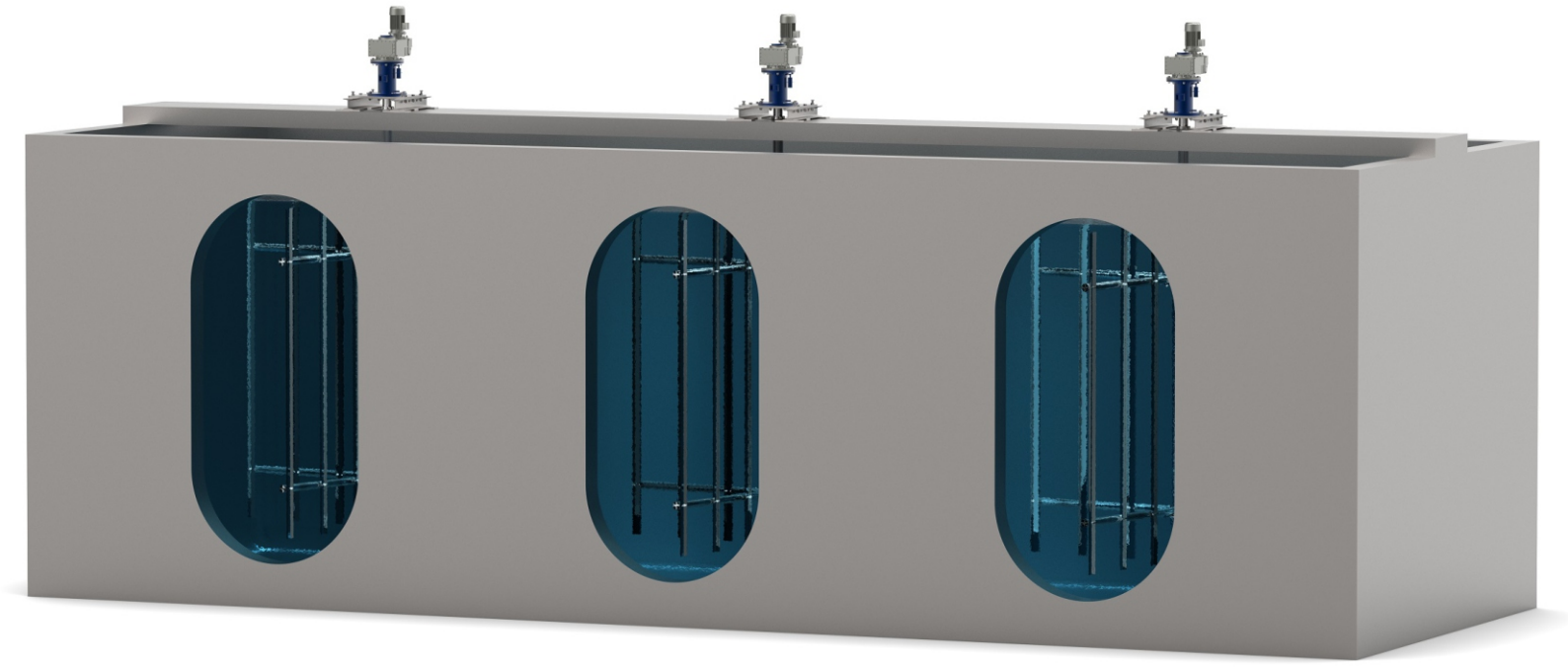
Paddlewheel Flocculator

Fluctuation is one of the important parts in water and wastewater treatment processes.

Fluctuation is a process in which small particles collide with each other softly and create bigger ones. In water and wastewater treatment industry, the starting point is flash mixing that creates micro-Flocs. In fluctuation stage, macro Flocs are produced as a result of Brownian motion in which particles collide with each other. Macro particles can sediment. Modern fluctuation systems are classified into mechanical and hydraulic methods. Among mechanical methods are paddle wheel, turbine mixers, and jet pumps; aeration methods belong to hydraulic methods.



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The commonest fluctuation method is horizontal and vertical paddle wheel fluctuation. Various tests and experiences have proved that this type of fluctuation has the highest efficiency in water and wastewater treatment industry. These methods are mainly used in places where the formation of biggest fluctuations and removing highest amount of solid particles is intended. Despite high initial investment and high preservation cost compared to other methods, this is still among the popular fluctuation methods.

Paddle wheel fluctuations are usually designed as three series tanks whose speed gradients reduces from highest to the lowest gradient.

The following table briefly compares fluctuation methods.

Description	Paddle wheel method	Turbine method	Hydraulic method
Fluctuation type	Big	Small to medium	Very big
Pressure drop	-	-	0.15 m
Process flexibility	Good	Ideal	Low
Investment	Moderate	Medium	Low
Maintenance cost	Medium	Low	Medium
Equipment manufacturing	Nearby difficult	Medium	Nearby difficult

The With many years of experience in producing paddle wheel fluctuation, this company offers its clients all services from design stage to the construction phase.

Process Design

Water and wastewater treatment plants designed by process engineers, are designed for predefined velocity gradients. This company uses software to do the computations and conduct all necessary calculations including power, size of paddles, number of paddles, point-by-point speed, etc. according to tank dimensions and velocity gradient. Computations are conducted according to the latest methods used across the globe.

Mechanical Paddle Design

After design in process phase, the initial design of the mixer is prepared by design department of the company. Before finalizing the design, all critical sections are analyzed by Finite Element Method and all necessary inspections such as frequency, stress, strain, fatigue, displacement, etc. is carefully carried out.

Mechanical Housing Design

Designing the bearing configuration is of the most critical parts of fluctuation mixer that should be designed most carefully. This housing should control all radial and axial loads and work for years without maintenance.

Paddle wheel mixer advantages

- Producing big Flocs
- High safety factor
- Low corrosion and abrasion
- Few annual maintenance
- Defected parts can be replaced easily
- Can be made from stainless steel
- Designed for continuous and heavy duty operation