xylem
Let's Solve Water

The Art of Mixing

Flygt mixers for wastewater treatment and industrial facilities

GEOFLUID
Evolving solid solutions.

FLYGT
a xylem brand

Innovating mixing technology for over 60 years

Xylem's Flygt brand has led the industry for over 60 years in developing innovative mixers for wastewater treatment and other processes. Every mixing solution is unique, which is why we work closely with our customers to ensure they get the best performance, reliability and efficiency.

Maximum reliability at minimum costs

When looking for a new mixer, you want to get the best performance for the least life-cycle cost. There are a number of important factors to consider, such as the mixer's longevity, its ease of use, and its total cost of ownership. Operational costs, for example, can quickly add up if your mixer often needs maintenance or involves manual work.

Energy consumption is another critical factor, since different mixers can require more or less energy for the same performance. Mixer positioning is also a key consideration. Since each mixing installation is different, with varying tank sizes, fluid properties and mixing requirements, you need a carefully designed solution to achieve the best results.

Key mixing concepts

Bulk flow
Bulk flow describes how fluid in the entire tank volume is moving. The overall mixing result is controlled by the strength of the bulk flow in the tank volume.

Thrust force
The mixer's propeller creates a thrust force that generates bulk flow. The required mixer thrust should be achieved with minimal power consumption.

Mixer positioning
A mixer's position and orientation in the tank are critical to maximizing performance. Positioning should be based on the mixing duties, each tank's layout, the mixer's thrust, and the fluid's properties.

Pioneers in mixer design

Flygt pioneered the use of thrust as the main performance parameter for mixer design, now established by the ISO 21630:2007 standard. Today, we carefully engineer each installation to capitalize on a tank's natural hydraulic characteristics.

What you can expect from Flygt mixers

- Reliable operations and peace of mind.
- Solutions designed to fit any tank shape and dimensions.
- Simple, fast installations that require minimum maintenance.
- Reduced manual work in the tank, minimizing downtime and safety risks.
- Reduced operating expenses and maintenance.

Flygt mixers – designed for efficiency and reliability

Today, over 300,000 Flygt mixers have been installed around the world, operating within all kinds of processes. We stand out as a leading manufacturer and partner, offering a complete range of mixing technologies that ensure low life-cycle costs.

We're here to help you

Customer satisfaction is at the heart of every aspect of our business. Right from the very beginning, our customers have been a vital part of the R&D that goes into the Flygt range of mixers. Over the years, we have been listening to your needs, which is why our mixer technologies are all such proven successes.

You can also rely on our unique tools and computational fluid dynamics (CFD) services to help you determine the right technology, mixer size and layout to meet your specific needs.

The best possible performance

We have a broad range of mixers, as well as monitoring and control solutions, that ensure that you get the best possible performance for your application. All Flygt mixers have durable components, designed in-house with carefully selected materials that can handle your specific submersible duties.

Flygt mixers are systematically tested for thrust and comply with the ISO 21630:2007 standard for submersible mixers of all sizes. Our highly skilled engineers and technicians can help you determine the thrust required to generate the bulk flow that best meets your mixing needs.

Flygt mixers in wastewater treatment processes

The Flygt mixer assortment includes a wide range of different models and sizes to match any demand in wastewater treatment processes. They are designed to handle various mixing processes for biological treatment, sludge treatment and pre-treatment in retention tanks and pumping stations.

Flygt mixers ensure optimized process results with significant energy savings. They have robust and high-efficient drive units with IE3 and IE4 motors, meeting energy-efficiency requirements, and unique hydraulics that maximize output thrust while minimizing power consumption. In addition, their propeller blades are designed to be self-cleaning, delivering non-clogging and trouble-free operation with low life-cycle costs.

+ Up to 50 % energy savings with Flygt Adaptive mixers

Flygt Adaptive mixers offer variable thrust to match mixer performance to actual demand, which avoids excessive mixing and wasted energy. Thanks to their high-efficient IE4 motor and integrated control electronics, Flygt Adaptive mixers can save up to 50% in energy consumption, with easy access to state-of-the-art control and monitoring functions. In many processes, Flygt Adaptive mixers can also adjust their speed and output automatically.

Large submersible mixers for high-efficient, low-speed mixing

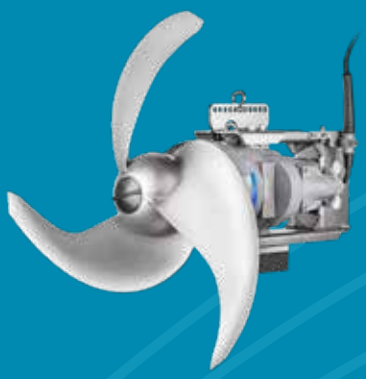
Flygt's signature "banana-blade" mixers are designed for gently mixing large volumes, providing efficient horizontal bulk flow and the lowest power consumption. These mixers are commonly used in wastewater treatment processes, such as for activated sludge, oxidation ditches, MBBR processes, sequencing batch reactors and retention tanks.

Product highlights

- Flygt 4320 is a low-speed adaptive mixer providing market-leading mixing efficiency. It has a high-efficient IE4 motor and integrated frequency converter to handle process variations.
- Flygt 4410, 4430 and 4460 mixers are equipped with dependable Class H and trickle-impregnated induction motors operating at fixed speed. These mixers are available with IE3 motor efficiency, generating significant energy savings.

Key features	
Thrust capacity	Up to 5200 N
Propeller diameter	1.4 – 2.5 meters
Propeller speed	Up to 60 rpm
Propeller material	Reinforced polyurethane
Propeller geometry	2-and 3-bladed with double-curved design
Power	Induction and permanent magnet motors up to 5.7/6.3 kW (50/60 Hz), available with IE3 and IE4 motor efficiency
Mixer body	Cast iron

Mid-size mixers for space-constrained processes



Flygt mid-size mixers are designed for tanks in wastewater treatment processes where large, low-speed mixers normally don't fit. The range of mid-size mixers includes high-efficient IE4 and IE3 mixers and dependable, high-speed compact mixers.

Product highlights

- Flygt 4230 is a compact adaptive mixer with high-efficient IE4 motor and integrated frequency converter with functions for advanced monitoring and control.
- Flygt 4530 is a low-speed mixer with a state-of-the-art propeller and proven drive unit with IE3 motor, ensuring uninterrupted mixing and low operational costs.
- Flygt compact mixers 4650 and 4660 have a wide range of configurable options and are built to last, with direct-driven induction motors with Class H insulation.

Key features

Thrust capacity	Up to 2940/3190 N, (50/60 Hz)
Propeller diameter	0.58 – 1.2 meters
Propeller speed	Up to 475/575 rpm, (50/60 Hz)
Propeller material	Stainless steel (SS 316), hard iron or duplex steel
Propeller geometry	3-bladed
Power	Induction and permanent magnet motors up to 10.0/11.2 kW (50/60 Hz), also available with IE3 and IE4 motor efficiency
Mixer body	Cast iron or stainless steel

Compact mixers and jet mixers for small tanks and shallow processes

Flygt's small and versatile compact mixers offer efficient high-speed mixing in a wide variety of processes. With easy and flexible positioning, the mixers enable output thrust to be directed regardless of tank layout. Flygt jet mixers are designed for dry and submersible installations, in tanks with low liquid levels or demanding sludge applications, and to prevent flooding in retention tanks.

Product highlights

- Flygt 4220 is a compact adaptive mixer with IE4 motor, delivering variable thrust and significant energy savings.
- Flygt 4610, 4620, 4630 and 4640 are small, compact mixers with a wide range of material options and propeller geometries for specific process demands.
- Flygt jet mixers combine the patented Flygt N-pump with an innovative and non-clogging ejector assembly for powerful and low-cost mixing.

Key features

Small compact mixers	
Thrust capacity	Up to 870 N
Propeller diameter	0.21 – 0.58 meters
Propeller speed	Up to 705/855 rpm, (50/60 Hz)
Propeller material	Stainless steel (SS 316) and hard iron
Propeller geometry	3-bladed
Power	Induction and permanent magnet motor available with IE4 motor efficiency
Mixer body	Stainless steel
Jet mixers	
Thrust capacity	Up to 4200/5250 N (50/60 Hz)
Rated power	Up to 55/63 kW (85 hp), (50/60 Hz)

Flygt mixers for biogas and industrial facilities

The overall range of Flygt mixers includes mixing solutions for biogas production, agriculture, aquaculture, and many industrial processes. Xylem has a complete line of mixers with superior thrust-to-power ratios, for every tank configuration and every substrate blend.

Biogas production

Flygt mixers play an important role in turning waste streams into biogas. Producing biogas efficiently requires effective pumping and mixing of often difficult substrates. The substrates for biogas production must be kept moving in the digestion process, as well as in storage.

Flygt's fully submersible mixers, with depth and angle adjustment, offer the most flexible configurations for the highest energy efficiency, and they are commonly used in pre-digester tanks, digester and post-digester tanks, and in effluent storage tanks. Each tank requires the right mixing system to keep the substrates moving and maximize energy production.

Our low-speed geared mixers and compact mixers provide robust, clog-free mixing. They generate the right bulk flow velocities with minimum energy consumption in both biogas and manure handling applications.

Manure management

Our reliable Flygt 4600 compact mixers deliver efficient, trouble-free mixing for a variety of manure characteristics, including manure that is dense or has high bedding materials. The mixers, which can be installed quickly and easily with a low capital investment, are perfect for flushing systems, meander systems and gravity channels, as well as storage tanks or slurry tanks when the jet stream produced in the large storage tank is insufficient.

Akvafuture AS

Aquaculture

Flygt 4630-4680 compact mixers are used for wastewater homogenization in onshore disinfection tanks, and they are a critical component of a treatment process approved by the Norwegian Veterinary Institute. These are also used for circulating fish silage in storage tanks and for pumping seawater into closed and semi-closed fish pens.

Flygt low-speed mixers are used in semi-closed containment systems for circulation and to ensure intake of pure, oxygen-rich water to maintain optimal conditions for fish welfare and sustainable fish farming.

Let us help you design the best mixer system

Each mixing project is unique. Xylem's experts have decades of experience in mixing for a wide variety of applications and operating conditions. With our expertise, combined with the most advanced computational fluid dynamics (CFD) modeling, advanced testing facilities, and an extensive database, we can help you find the most cost-effective mixing solution that lasts for years.

Advanced research on mixing

At Xylem, we're continuously improving mixing methods by testing and verifying their performance, creating a continuous feedback loop. We combine experiments in the laboratory with field tests and CFD modeling. This gives us the knowledge to create robust and reliable mixing solutions for our customers.

At our R&D lab in Sundbyberg, Sweden, we invest heavily in advanced research on mixing. Several fluid mechanics and CFD specialists conduct a wide range of tests on mixing systems. The lab includes tanks of various sizes and shapes, enabling simulation of real-world mixing conditions.

Our testing facilities include equipment for lab and field work, and sample testing. This includes velocity measurement and visualization systems such as acoustic Doppler velocimetry (ADV) and particle image velocimetry (PIV), as well as total suspended solids (TSS) sensors, tracer detection probes, and a rheometer.

The Mixing Handbook

To assist mixing system designers and specialists, Xylem published the *Handbook of Mixing for Wastewater and Similar Applications.* Written by Xylem's Lars Uby, Ph.D., it is the industry standard for mixing system design.

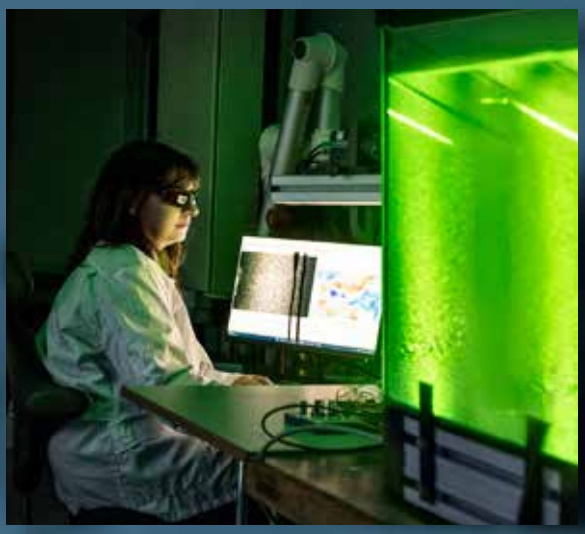
The 260-page technical guide includes more than 300 diagrams and detailed sections on elements and applications of mixing, mixing system design, and specification and verification of mixing. The handbook is fully indexed and cross-referenced to make it easier to find information.

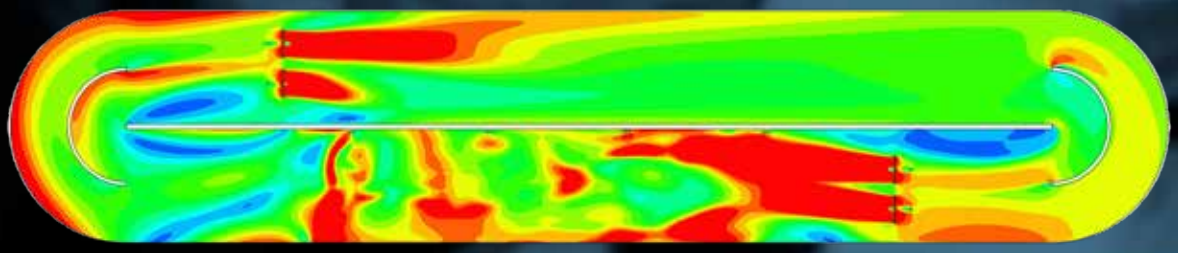
Download the handbook here:

State-of-the-art CFD modelling at your disposal

Xylem provides world-class CFD services in-house to help customers find the right mixing system for their needs. Our team is specialized in the design and study of mixing, aeration and pumping applications and uses advanced computational methods.

Addressing the complexities of liquids, solids and gases during the design stage, with detailed modelling, helps us identify and prevent issues that may arise after commissioning the equipment. It also enables us to optimize the equipment and processes. To use our CFD services, contact your local Flygt support team to get started.





CFD benefits for mixing optimization

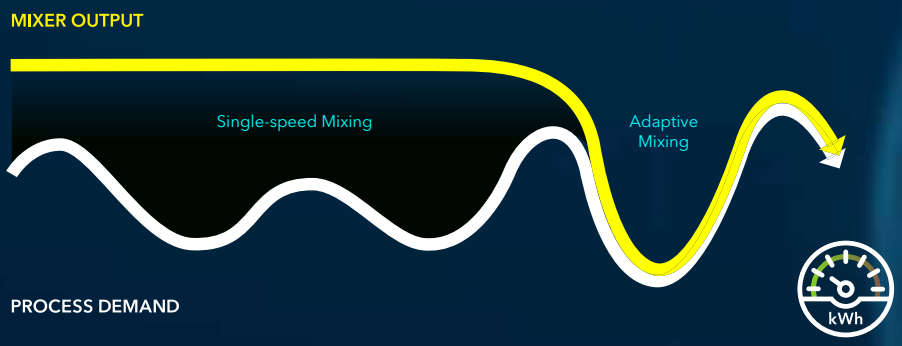
- Selecting the best mixing solution for optimal treatment
- Risk assessment under required running conditions
- Troubleshooting of existing installations
- Excellent visualization of the resulting flow and processes

Wide range of CFD services

- Validated mixer performance
- System response analysis to critical parameter fluctuation
- Solution optimization using state-of-the-art CFD models
- Close collaboration with our customers on all stages of the CFD evaluation

Monitoring and control for Flygt mixers

Flygt mixers are designed to offer the level of monitoring and control that best suits your individual needs. For decades, we have provided our robust mixers with a simple relay to shut down and trigger an alarm if the mixer is overheating or leaking. However, since many plants are now more automated, with interactive systems, we offer more innovative solutions to better align with those needs.



+ Intelligent mixers that take care of themselves

Our Flygt Adaptive mixers can be installed preprogrammed to operate autonomously, without any external control connections. They have programmable ramp rates for soft starting and an unusually wide range of fixed speed settings for reduced power consumption and wear. They also have self-protecting logic that will slow down the mixer, either to dislodge items caught on the propeller or to avoid damage if overheating. The internal controls keep an alarm log for easy trouble shooting.

+ Easy controls and full automation

With the addition of our standard DIN rail-mounted gateway, the mixer can present all its relevant information on a tank-side human-machine interface. You can also adjust mixer speed with the touch of a button to save energy and reduce wear. Modbus RTU or TCP communications provide rich data and full control to local PLCs or SCADA systems.

Selecting the standard DIN rail-mounted controller provides all the gateway features plus a number of preprogrammed application control schemes that translate local inputs directly into mixer speed adjustments, without the need for wider system controls or programming.

Cloud-based monitoring and control solutions

Flygt offers cloud-based monitoring and control systems that enable you to monitor mixers, pumps and other equipment on a single dashboard. The systems send warnings and alarms directly to your phone and other devices, and can present insights into possible solutions when issues arise. Our systems can serve as an affordable alternative to advanced SCADA, and they include APIs for integration with other customer systems. All backed by Xylem's high-quality cybersecurity protocols and experts.

Aftermarket services, spare parts and support

You can rely on Xylem's global network of service centers and authorized service partners. We're always nearby and ready to provide all levels of maintenance and repair services to keep your Flygt mixers running without downtime and to ensure their long life in your operating conditions.

On-site and workshop services

Depending on your needs, we can quickly support you with all levels of services, e.g., audits, regular inspections and preventive maintenance on site, or major overhauls in any of our workshops.

Servicing your Flygt mixer at recommended time intervals and according to your process conditions is crucial to ensure long product life and to maintain its original performance. Depending on mixer models and media conditions, the time interval for a major overhaul can be up to 10 years, thanks to our durable designs.

Guaranteed spare part availability

The components in Flygt mixers are developed to work perfectly together, and every component is available as a spare part. Most spare parts are available 10 to 20 years after the product is no longer produced in our factories.

A Flygt mixer will only deliver its optimal performance when Genuine Flygt Parts are used and when the work is done by an authorized Xylem service provider. Together with our innovative technological solutions and high-quality parts, our service providers will ensure trouble-free operations and peace of mind.

Xylem |'zīləm|

1) The tissue in plants that brings water upward from the roots
2) A leading global water technology company

Xylem (XYL) is a leading global water technology company committed to solving critical water and infrastructure challenges with innovation. Our more than 17,000 diverse employees delivered revenue of $5.5 billion in 2022. We are creating a more sustainable world by enabling our customers to optimize water and resource management, and helping communities in more than 150 countries become water-secure.

Join us at www.xylem.com