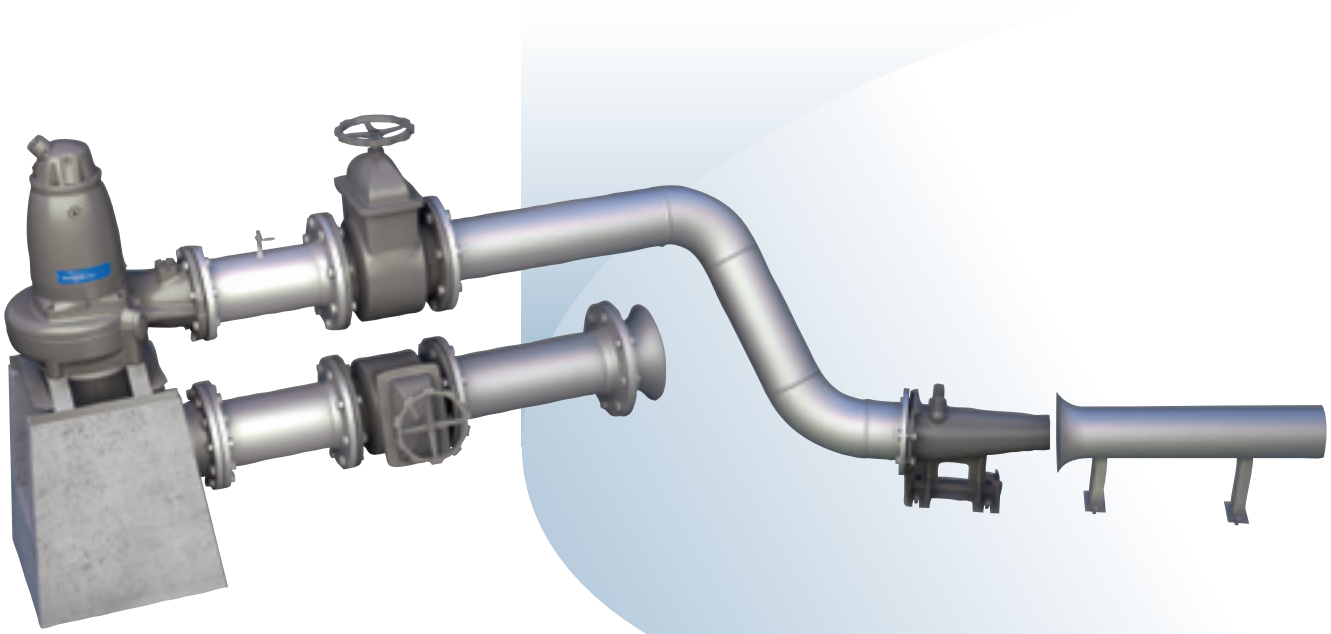
ITT

Water & Wastewater

Flygt jet mixers

Dry-installed N-technology for efficient mixing



Engineered for life

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The perfect mix

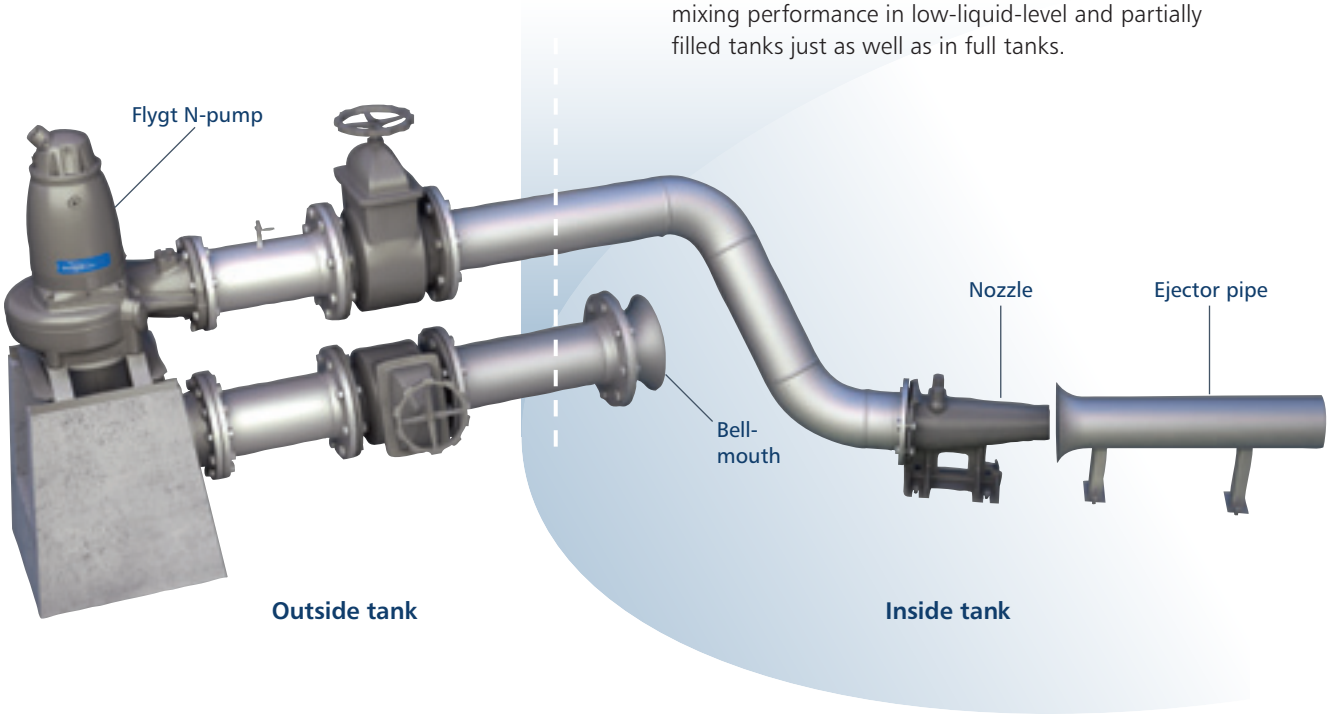
As pioneers of submersible mixer technology, ITT Water & Wastewater have been at the forefront of developing mixing technology for 50 years.

Flygt jet mixers from ITT Water & Wastewater combine the patented Flygt N-pump with an innovative ejector assembly for high-efficiency, low-cost mixing. These are ideal for demanding wastewater and sludge applications where dry installation is preferred.

Dynamic duo

Preventing solids deposition is a constant wastewater treatment challenge. Minimizing particle settlement and subsequent sediment buildup requires strong bulk flow. Flygt jet mixers deliver just that.

Combining two Flygt innovations into a powerful Flygt jet mixer system provides the highest sustained efficiency at the lowest possible cost. Extremely versatile, this floor-mounted system delivers powerful mixing performance in low-liquid-level and partially filled tanks just as well as in full tanks.



How it works

These key components comprise Flygt jet mixer *the intake bellmouth, Flygt N-pump, the nozzle and the ejector pipe.* Working in concert, these components optimize the mixing of wastewater or sludge.

The intake bellmouth enhances dynamic flow to the pump and reduces hydraulic losses. The nozzle and ejector pipe arrangement increase the efficiency of the jet entry into the tank by augmenting the cross-sectional area of the jet. All in all, this contributes to greater energy efficiency, which in turn creates significant energy savings.

Benefits

- **Maximum uptime and mixing efficiency**
- **Sustained pump efficiency and reduced energy costs**
- **Compact pump design with no need for special housing**
- **Easy to access and service when standing outside the tank**
- **Operative at shallow liquid levels**
- **Robust handling of sludge with a dry solid concentration of up to 8%**

Flygt N-pump

Unlike conventional solids-handling pumps that experience efficiency loss due to clogging, Flygt N-pumps keep pumping efficiently no matter what the wastewater may contain. We call this sustained efficiency. This is possible thanks to the patented self-cleaning N-hydraulic featuring machined backswept leading edges, an extended relief groove, and integrated guide pine. The result: maximum uptime, maximum efficiency, and minimum maintenance costs.

The Flygt N-pump is a reliable partner, even in the toughest of applications. In addition to its exceptional clog-resistance, patented N-pump technology handles municipal sludge with a dry solids concentration of up to 8%. For abrasive applications, the durable Hard-Iron™ hydraulic is available to keep the N-pump operating at its maximum efficiency. Flygt N-pumps are also available in explosion-proof versions.

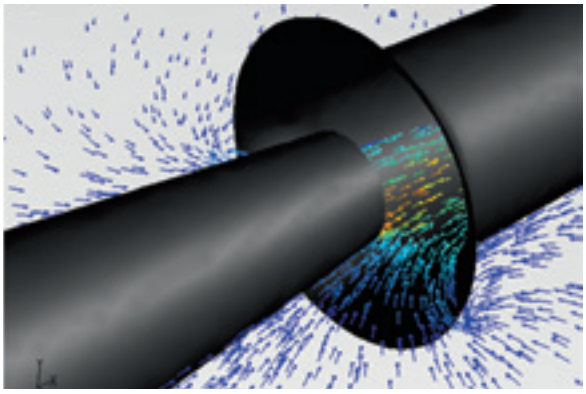
Dry installation of the submersible Flygt N-pump has clear advantages, inside and out. Unlike conventional dry-installed pumps, the Flygt N-pump has an integrated electric motor/hydraulic assembly housed within a single structure. This makes the Flygt N-pump more compact and therefore easier and less expensive to install. A submersible-designed pump, by definition, is also flood-proof. What's more, no external housing is required to protect the pump against the elements, which significantly cuts installation costs.

Thanks to intelligent design and virtually troublefree operation, total life cycle costs are kept to an alltime low. Its sustainable design means reduced energy consumption and a smaller carbon footprint, too.

The patented N-hydraulic features an impeller with backswept leading edges, an extended relief groove and integrated guide pin for sustained efficiency.

Innovative ejector assembly

Carefully engineered, the non-clogging ejector assembly consists of a large discharge nozzle and an ejector pipe with a specially shaped inlet. The diameter of the nozzle outlet is designed to pass any size solid that can pass through the pump. The pump creates a primary flow that is delivered to the tank through the nozzle. As this flow enters the ejector pipe, a secondary flow is induced from the surrounding liquid.



The computer fliud dynamic simulation shows the unique interaction between the discharge nozzle and the ejector pipe. The primary flow is enhanced by the subsequent generation of the secondary flow.

Stir up efficiency with Flygt jet mixers

Easy access and maintenance. Since there are no mechanical moving parts inside the tank, access and maintenance are simplified. Should repair be required, service staff can easily access the pump while standing outside the tank. This makes quick and easy work of maintenance and saves time and money.

Safe working environment. Because the Flygt N-pump is installed outside the tank, it virtually eliminates risks to worker health and safety since there is minimal human exposure to wastewater pathogens.

Reduced capital expenditures. The jet mixer pump may be used for tank loading, effectively eliminating the need to purchase a separate pump for offloading.

Comprehensive jet mixer range

ITT Water & Wastewater offers a comprehensive range of jet mixers as a complement to our submersible mixer systems.

Five types of jet mixer models are available to meet your unique mixing requirements. These systems ensure safe, reliable operation with high pump efficiency and low maintenance. This ultimately translates into lower life cycle costs.

Flygt jet mixer	JT4710	JT4715	JT4720	JT4730	JT4735
Thrust [N] (50Hz)	320	580	1380	3720	4200
Thrust [N] (60Hz)	–	690	1400	3930	5250
Flygt N-pump	NT3102	NT3127	NT3153	NT3202	NT3301
Rated power [kW] (50Hz)	2.4	4.7	13.5	37	55
Rated power [kW/hp] (60Hz)	–	5.5/7.4	14.9/20	45/60	63/85
Nozzle outlet diameter [mm]	80	102	120	171	171
Ejector outlet diameter [mm]	150	200	200	300	300

Outside the tank: The Flygt jet mixer N-pump. Stainless steel pipework is fitted to the tanks for suction and delivery.

Inside the tank: The nozzle and ejector pipe are located to generate a bulk flow loop, which leads to re-suspension and homogenization of the mixed sludge.

Rough duties for rugged mixers

Built to deliver process quality and overall energy efficiency, Flygt jet mixers are an excellent choice for use in biological treatment process tanks, sludge tanks, retention basins and lagoons.

1 Retention basin
Mixing and flushing are required here to ensure that solids remain in suspension when wastewater is pumped out.

2 Storage of primary and external sludge
Primary sludge and sludge received from external sources often contain significant amounts of large particles. To prevent gas accumulation, sedimentation and crust build-up, mixing is required.

3 Storage of waste-activated sludge
Mixing is required in sludge storage tanks for homogenization, which is essential for treatment efficiency. Mixing also prevents gas accumulation and the build-up of sediment and crust.

4 Digester
Mixing is required to to homogenize the volume of the digester. A well-mixed digester increases the efficiency of the digestion process including gas production.

5 Storage of digested sludge
Mixing is required in sludge storage tanks to maintain homogeneity before thickening or dewatering sludge.

Maximizing performance through our expertise

ITT Water & Wastewater has the expertise and experience required to optimize the design and performance of your mixing processes. Our application engineers share their insights and advice on how best to equip sludge treatment facilities with powerful mixers that make signification contributions to the overall performance of your plant.

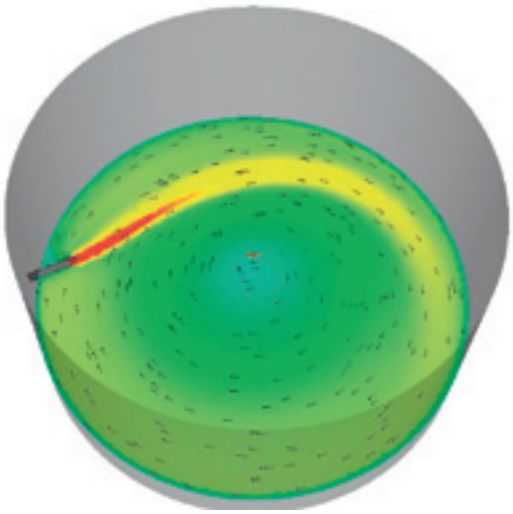
Only the finest selection

As pioneers in the selection of mixers based on thrust, we know that tank design, type of media, solids concentration and process demands are key variables. With this in mind, we use our proprietary mixer selection software to calculate the required amount of thrust to achieve the perfect mixing result.

Perfectly positioned for mixing

Efficient mixing also requires correct mixer positioning of the jet mixer. The positioning is determined by the mixing duty, and our recommendations are always based upon your particular installation, including the tank and fluid properties.

Our experienced team begins by evaluating your requirements and recommending a solution. This may be based on a standard simulation or a full analysis of your mixing system. One of the tools we use to ascertain the correct sizing and positioning of your jet mixers is Computational Fluid Dynamics, CFD.



Flygt jet mixer installed in a sludge holding tank. The simulation shows the jet's entry into the tank to resuspend the contents.

Improve performance with control and service

Flygt monitoring and control improves the uptime of your wastewater treatment plant leading to lower operational costs.

We supply both the hardware and the software for complete process systems – ranging from SCADA, process and pump controllers to pump drives, start equipment and sensors through to system software.

With smart monitoring and control, you benefit from predictive maintenance. Our system automatically alerts you at an early stage when service is required, and signaling when corrective actions are necessary. This effectively eliminates unnecessary emergency service calls and cuts both operating and maintenance costs.

World-class service, world-class value

All Flygt high-performance mixers are backed by the worldwide service and support organization of ITT Water & Wastewater. Because no systems are alike, we let you choose the support package that best suits your needs.

On the one hand, we help select the right product for a new application. On the other, we can assist your with everything from system planning and design to construction and commissioning to operation and maintenance.

Whether you require planned maintenance or express delivery of a part, you always get the support you need through our local network of service centers and service partners.

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ITT Water & Wastewater is a global provider of water handling and treatment solutions for municipal and industrial customers in more than 140 countries. ITT designs and delivers energy-efficient solutions and related services for water and wastewater transport, biological treatment, filtration and disinfection. The company employs nearly 5,000 people through its global sales network, manufacturing sites in Europe, Asia and the Americas, and global headquarters in Stockholm, Sweden. ITT Water & Wastewater is a business of ITT Corporation, a high-technology engineering and manufacturing company operating in three vital markets: water and fluids management, global defence and security, and motion and flow control.

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