N-PUMP SERIES
FOR MAXIMUM RELIABILITY AND EFFICIENCY IN WASTEWATER HANDLING

Flygt

ITT Industries
Engineered for life
Reduced pumping efficiency, high energy and maintenance costs shouldn’t be a fact of life in wastewater handling. The N-Pump series from Flygt features a radical new hydraulic end design which ensures efficient, reliable and trouble-free pumping over long duty periods. The result: improved operational economy which can dramatically reduce the total life cost of your installation.

The N-Pumps maintain a high level of pumping efficiency, even in fluids with a high solids and fibrous content, thanks to a unique open-type self cleaning impeller. This is complemented by a special relief groove in the volute. This design greatly reduces the risk of clogging by the self cleaning flow path through the pump. The result is lower power consumption, even under the worst conditions.

Extensive field and laboratory tests have proved that the N-Pump is superior to any state-of-the-art wastewater pump design, both in efficiency and clog resistance.
Simpler installation means lower construction costs

To reduce the cost of installation, Flygt has standardized many of the main elements of pumping stations so that they can be combined in different ways to match specific site conditions. The examples illustrated here show the flexibility of the system, and provide some guidelines for optimizing the design of your own station.

NP
- This installation with guide bars and discharge connection bolted to the sump floor. When a pump is lowered down the guide bars, it automatically locks to the discharge connection, and is automatically released when raised.

NS
- Transportable version with pipe or hose connection, that can be lowered directly into the water. The pump is mounted on a stand and the hose is connected to the volute. This configuration can easily be moved from sump to sump.

NT
- Dry installation with the pump mounted vertically. This is often used in retrofit installations, and for replacing long shaft pumps.

NZ
- Dry installation with the pump mounted horizontally. This is used where space inside a pump station may be very restricted. Horizontal mounting also ensures ease of serviceability.
The broad range of power output, coupled with the self-cleaning advantages of the impeller and volute design, opens up new possibilities for cost-effective operation in a wide variety of applications. These include pumping:

- Wastewater
- Raw water
- Cooling water
- Sludge
- Storm water
- Industrial effluent

Before being introduced, the N-Pumps were subjected to more than 50 live field tests, logging over 100,000 hours of operational duty in a number of different situations. The results from these tests show considerably lower energy consumption and less running problems. The highest efficiency value for a typical single-vane pump in a best-specific speed range is around 70 percent efficiency. By comparison, N-Pumps deliver 80 percent or better – equating to 15 percent less power consumption.

In several tests, where clogging of the conventional pump was an issue, the power saving was as great as 50 percent.

Choosing the optimum pump is further simplified through the use of FLYPS, Flygt’s dedicated pump selection software.

Three models from the N-Pump range, showing a combination of drive and hydraulic units. Their characteristics are matched to give the optimum hydraulic efficiency: 80% and more has been achieved.
Demonstrating the pumping performance of the N-Pump series:

### N-Pump general performance range

<table>
<thead>
<tr>
<th>Model</th>
<th>3127</th>
<th>3140</th>
<th>3152</th>
<th>3170</th>
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<td>60 Hz, 15 hp</td>
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<td>200 mm/8&quot;</td>
<td>250 mm/10&quot;</td>
<td>300 mm/12&quot;</td>
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</table>
The Design

Product quality means paying attention to details

Heavy duty motors
Rather than using standard, off-the-shelf motors, we manufacture our own units. Each is designed for safe, reliable operation in submersible applications. Designing our own motors also allows us to build in wide margins of safety for a long and trouble-free service life.

All motors in the N-series pumps are squirrel cage induction units, specially designed and manufactured by Flygt for use in submersible pumps. Stator windings are insulated to Class F and rated at 155°C (319°F), allowing for up to 15 starts per hour. The stator is heat-shrink fitted into the housing for superior heat transfer and locked against rotation for perfect alignment with the rotor. There are no external stator locking bolts which could lead to leakage.

Seal wear protection
SPIN OUT™ is a patented design that protects the outer seal by expelling abrasive particles from the seal chamber. As an integral part of the cast-iron housing, SPIN OUT is as simple as it is effective.

Deflection-proof shaft
A short overhang of the shaft virtually eliminates shaft deflection. This results in significantly increased seal and bearing life, low vibration and quiet operation.
Separate junction box
Sealed off from the motor, the large junction box has been specially dimensioned to allow easy access. Wiring has been simplified by providing clearly marked terminal boards.

Built-in cooling
All pumps rated above 9kW have a built-in cooling system. The pumped liquid flows around the stator housing inside a cooling chamber. For smaller pumps, cooling is achieved via fins on the stator casing. Additional external cooling is available as an option.

Monitoring
Thermal sensors embedded in the stator windings help prevent overheating. Leakage sensors in the stator and oil housings, together with external monitoring equipment, are available as options.

Long life bearings
Bearings in all Flygt pumps have been designed to provide a minimum 50,000 hour service life.

Multi-functional oil housing
The oil-filled housing acts as a buffer, providing additional security against liquid penetration. The environmentally-friendly oil in the compartment both lubricates and cools the seals.

International standard approvals
All pumps are tested and approved to national and international standards (IEC 34-1, CSA). Also available in Factory Mutual and European Norm (FM and EN) approved explosion-proof versions.

Double mechanical seals
ITT Flygt design and manufacture all shaft seals specifically for use in submersible pumps. Two sets of mechanical shaft seals work independently for double security. A corrosion-resistant tungsten carbide (WCCR) is used, providing excellent mechanical strength and significantly less wear thanks to its superior sliding properties.

High-efficiency hydraulic end
The unique design of the N-Pump impeller gives a clog resistance superior to that of a screw-type impeller. The self-cleaning characteristics of the impeller, enhanced by a special relief groove in the pump housing, ensure that a reliably high level of pumping efficiency is maintained over long duty periods, an important factor in reducing overall operating costs.

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Unique impeller design means better performance all-round

The revolutionary design of the self-cleaning impeller is complemented by a special relief groove in the volute. This patented combination, which provides a self-cleaning flow path through the pump, greatly reduces the risk of clogging and makes the N-Pump series an ideal solution for high-efficiency pumping over long duty periods. That means lower overall energy consumption: a significant factor in reducing the whole life cost of your pumping operation.
Higher hydraulic efficiency over time

The red line in the graph shows how the efficiency decreases when a conventional wastewater pump in continuous operation gets clogged. The green line shows how a conventional wastewater pump that runs intermittently also has a generally low efficiency, due to clogging. Temporary efficiency gains may be achieved through back flushing of the pump. The blue line shows the N-Pump.
Accessories

Keeping your station in top form

Supplying our customers with problem-free solutions is our goal at Flygt – and that means more than simply supplying the correct pump for your particular application. The following are examples of some of the ancillary equipment which we can supply to improve the all-round efficiency of your operation.

The sump designed to clean itself

The unique design of The Optimal Pump station sump, with its integrated discharge connections, is an ideal cost-efficient solution for new stations and retro-fitting older stations. The sump has been hydraulically optimized to improve the flow over the sump floor during pumping.

The result: increased turbulence, causing resuspension of settled solids and the entrainment of floating debris, which can then be pumped away during the operating cycle.

APF: automatic cleaning up to 40 times a day

APF is the maintenance-free control system that ensures clean stations even when you’re dealing with the most heavily-contaminated wastewater.

The APF is simply connected to the main control system, which it overrides during cleaning cycles by operating the pumps down to the level at which air starts to be drawn into the pump.

At this level, controlled turbulence and maximum velocities cause any solids, which have settled on the sump floor, to be drawn into the pump together with any debris floating on the surface. The unit can be programmed to operate up to 40 times a day.

Flush valve: the automatic desludger

Developed specifically to be fitted to all standard Flygt submersible pumps, the Flush Valve operates completely automatically.

Attached easily to the volute of the pump, the valve is open at the start of each pumping cycle and water is forced through the valve in a powerful jet flushing stream. Water in the sump is immediately subjected to intense turbulence, and all the sludge deposits, as well as floating solids, are re-suspended before being pumped out. The valve closes automatically after approximately 20 seconds, and reopen again after pump stop, ready for the next pumping cycle.

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Flygt's design philosophy has always been to build equipment that gives you a maximum return for your investment: and that means designing pumps for a long service life with minimum downtime.

If you already operate an installation with Flygt C-Pumps, the new N-Pump upgrade kit gives you an opportunity to further extend the operational life of your equipment and gain the superior pumping efficiencies of the N-Pump range.

Each kit contains everything you need to upgrade your existing pumps to N-Pump standard, and there's a kit available for most C-Pump models (please check with your Flygt representative which models apply). Kits are easy to install and fully supported by the Flygt Service Network.

The upgrade kit allows you to:
- Cut the cost of regular and emergency maintenance by reducing the risk of clogging
- Boost the operational efficiency of your existing equipment
- Improve the return on your original investment

No two pumping stations and systems will be alike, so the level of maintenance and support that you require from your service partner will differ according to your situation. With Flygt, you can choose the type of support package that precisely meets your needs.

From simply supplying pumps to your specifications, to full service assistance on system planning, design, construction, implementation, operation or maintenance: Flygt's total service concept means that you get the service you need, on your terms.

We guarantee availability of spare parts for 15 years after we stop production of a pump model. This is just one of the ways in which Flygt guarantees its long-term commitment to customers.
You and Flygt – working together for optimum results

The Flygt name is internationally recognized as meaning efficient, versatile products of the highest quality. All our products pass some of the most stringent manufacturing standards in the world today. But Flygt stands for more than just product excellence.

With more than 50 years’ experience in submersible technology, Flygt engineers have accumulated a wealth of state-of-the-art know-how in designing all kinds of fluid management products. To this end, Flygt is often asked to act as advisors to engineers, planners and consultants to industrial companies and water authorities. The results have often been that systems operated in accordance with our recommendations have proved to be the most efficient and profitable solutions for our customers’ needs.

Today, Flygt is the world’s leading manufacturer of submersible pumping and mixing equipment and fluid handling technology. The company is represented in over 130 countries.