



# Trouble-free pumping in problem slurry sumps

FLYGT 5000 SLURRY PUMPS

50 Hz



# The Troubleshooters

**Slurry sumps** can be a headache. Pumps wear hard and fast. They need servicing between maintenance intervals. And the sumps fill up with sediment.

**Cantilever pumps** are often not up to the task. We know, because that's when we are called in: when an installed slurry pump is not doing its job.

## They just run

But Flygt slurry pumps are different. Even in the most abrasive slurries, all they need is regular planned maintenance. And even with the coarsest, heaviest slurries, they can keep sumps solids free. As one plant engineer says: "They just run!"

## Whatever you throw at them

There are over 5,000 Flygt slurry pumps out there working around the clock in a wide range of applications –



**Construction & tunneling:** transferring and removing drilling residue



**Mining & quarrying:** cleaning main drainage basins of settled solids, slurry tailings removal/reprocessing



**Industrial:** transporting abrasive run-off from storage, cleaning conveyor areas, draining overflow sumps as well as pulp and paper tanks



**Municipal:** removal of sediment from grit chambers/sand traps

**Here are a few examples of where you can find Flygt slurry pumps and what they are pumping –**

**Australia:** mining, removing mineral processing slurry  
**Brazil:** coal mines, transferring and removing drilling residue  
**Canada:** mining, removing mineral processing slurry  
**China:** coal-fired power plant fly-ash pumping, removing slurry  
**Germany:** steel plants, cooling water with abrasive particles

**Peru:** sump pumping and tailing dam reprocessing, removing sediment from tailings dams  
**South Africa:** mineral processing plant sump pumping, dust control effluent pumping  
**USA:** mining, dredging, cooling oil supply in machining process, bottom ash removal

# When hard metal is not tough enough

For handling really abrasive slurries, pumps need more than just alloys with a high chrome content: the impeller and volute must be designed to reduce the impact of solids on the wear surfaces. With the help of 21st century computational fluid design tools, we have increased the abrasion resistance of Flygt slurry pumps in three ways:

## 1 Increasing the size of the volute

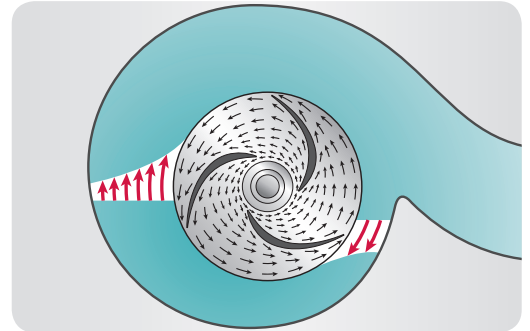
What happens to water that's running down a hill when it passes through a narrow area? It runs harder and faster. We have done the opposite: by increasing the size of the volute, we slow down the speed of the slurry, and so reduce wear.

## 2 Keeping the solids flowing

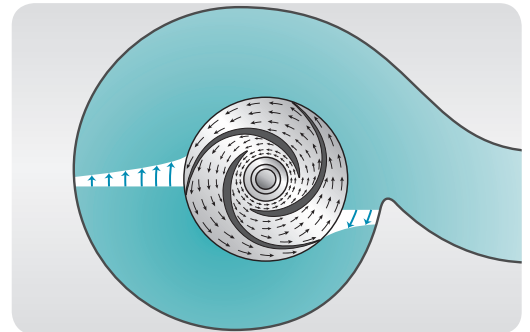
A strange thing happens when pumping slurries: the medium (i.e. the water) moves faster than the solids. In fact, the medium moves so much faster that the two separate. The result? Very high wear rates. To counter this, our slurry impellers feature long swept-back vanes. This advanced design ensures a homogenous mix and keeps solids moving in-step with the flow of the medium.

## 3 Reducing particles' angle of impact

The vanes in a standard impeller are optimized to transport water. But there's a problem when you pump slurries: the angle of the vanes has the unintended effect of making solids slam into the volute wall head on. This leads to unacceptable levels of wear. However, with its long swept-back vanes, Flygt slurry impellers make the particles' flowlines follow the geometry of the volute, thus reducing wear.



Standard hydraulic design makes slurry move at high velocity.



Flygt hydraulic design reduces slurry speed.



Standard impeller slams solids into the volute.



Flygt impeller keeps solids moving with the flow.



## Your task. Our force.

Whatever the dewatering challenge we have the solution for you. Sludge, slurry, big pumps, small pumps, electrical or diesel driven, corrosive abrasive particles or high pH levels, we have the pump that matches your requirements with a reliability and performance second to none. From the legendary Flygt Bibo to the lightweight Ready, the rock-solid Flygt 5000 to the independently-powered Godwin there is no other company that covers the full spectrum of dewatering needs like Xylem. We've got your back!

# Keeping even the worst sumps clean

A sump that fills up with sediment causes all kinds of problems. At best, it means periodically digging out the solids. At worst, it can lead to flooding and process stops. At Xylem, we have an array of measures to keep sumps clean - we call it Clean Sump Technology.

## Effective cooling - cleaner sumps

The more often a pump starts, the less time sediment has to settle. Many pumps can only start around 15 times an hour, but Flygt pumps can start up to 30 times an hour. This is due to effective cooling and because we design all electrical motors ourselves specifically for submersibles. The internal and external cooling also means that our pumps can pump down to very low levels, discharging more solids, in every pump cycle.

## Unique agitator design

Many agitators have a limited effect. This is because they create a radial flow that stirs the fluid but does not create enough turbulence to resuspend solids. However, Flygt agitators create a strong vertical thrust that forces settled solids into suspension even from sump corners.

## Submersible mixers - for the heaviest slurries

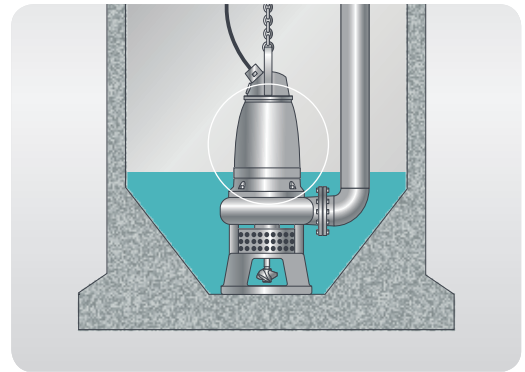
For large sumps receiving coarse, heavy particles, Flygt submersible mixers have the power to suspend even the heaviest solids. Our submersible mixers can either be mounted directly on the side of your slurry pumps, or separately on sump walls.

## Smart sump design - less solids build-up

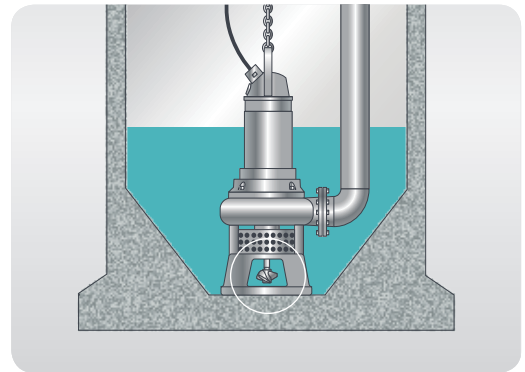
When installing pumps in new installations, we can help design sumps that will reduce sediment build-up. With correctly angled walls, solids will collect in the area directly beneath the pump inlet and agitator. In addition, our narrow sump designs ensure that the turbulence created by the agitator will act on all settled solids, reducing the risk of dead corners and sedimentation.

## Sump depths of up to 20 meters

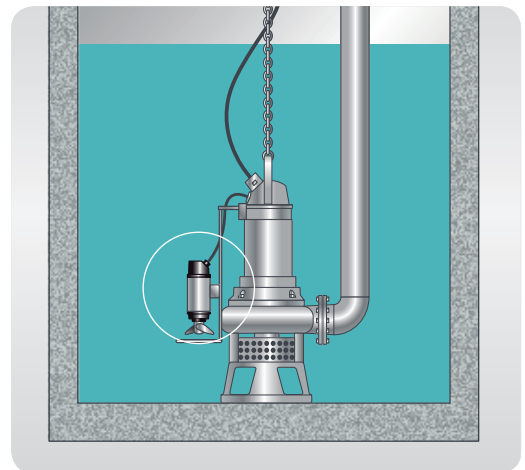
The deeper the sump, the greater your safety margins. Flygt slurry pumps - which are not limited by shaft length - can work in pits up to 20 meters deep. This gives you larger sump volumes and less risk of overflows.



Internal cooling allows pumping down to very low levels.



Unique Flygt agitator creates strong vertical thrust.



Side-mounted mixer for really tough sumps.

# Why submersibles

Flygt submersible slurry pumps offer many advantages over dry installed pumps. Some we have already described on the facing page. Here are a few more.

## **Low construction costs**

Operating directly in the slurry, a submersible slurry pump requires no support superstructure. Submersibles therefore reduce construction costs and occupy less space.

## **Easy to install, easy to move**

Submersible pumps are easy to install because the motor and volute form a single integrated unit. With four different installation methods to choose from (see page 8) you can use one Flygt slurry pump in any number of sumps, basins and tanks.

## **Reliable operation**

Once installed, submersible pumps require almost no supervision. Since there are no long or exposed mechanical links between the motor and the volute, less maintenance is required, and operating costs are significantly lower.

## **Quiet and flood-proof**

With a motor that operates beneath the surface, a submersible pump produces very little noise. And of course, a submersible pump is, by definition, completely flood-proof.



## **One pump, many tasks**

Flygt slurry pumps are compact and therefore easy to move around. Requiring no superstructure, they are quick to set up and so can be utilized in multiple locations. You can buy and/or rent Flygt slurry pumps from Xylem in over 150 countries around the world.

# Peace of mind - it's in the details

A chain is only as strong as its weakest link. That's why we pay attention to the details: it's only by eliminating all the weak links that we can supply pumps our customers really can rely on. Pumps that give them greater peace of mind.

## High chrome content (but not too high)

A high chrome content is essential when pumping abrasive slurries. But more is not better: much over 25 percent and the impeller becomes brittle. The impeller and volute in Flygt slurry pumps have 25 percent chrome, which has proven to give the perfect balance between abrasion resistance and mechanical strength.

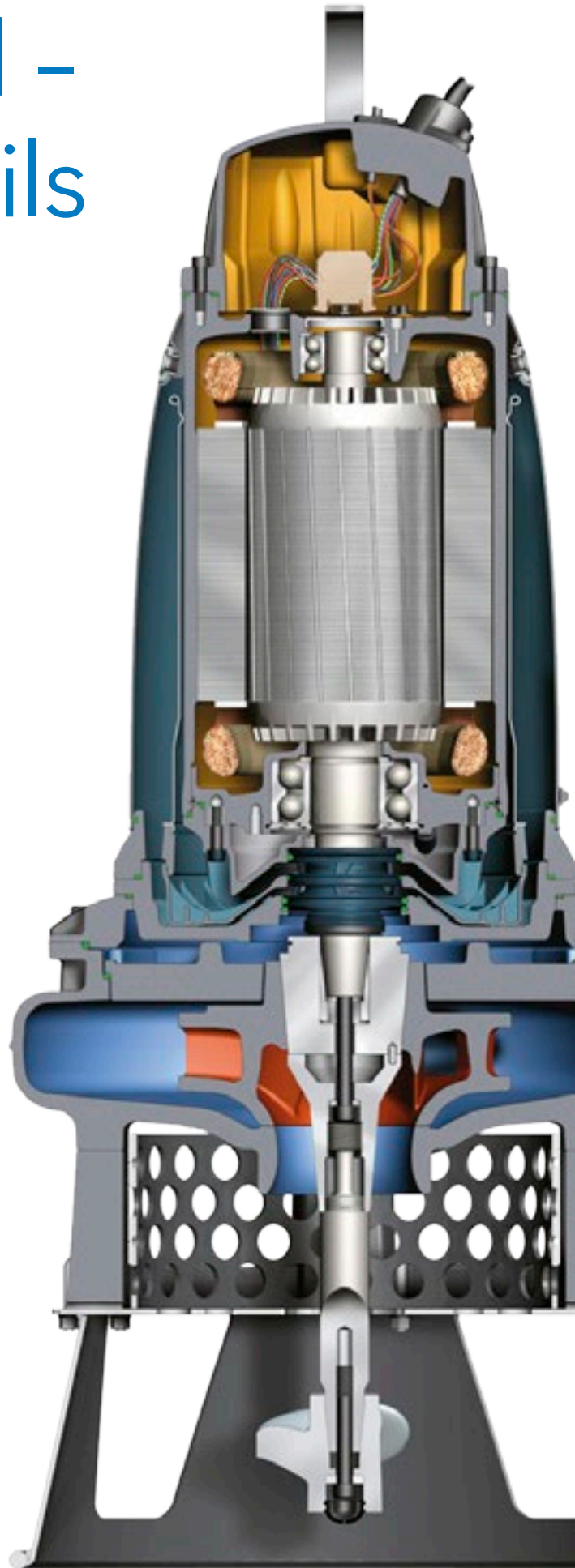


## Smart impeller design

The swept-back design of Flygt impeller vanes minimizes the separation of solids from the carrying fluid for a more homogenous flow. This results in a slower rate of wear.

## Larger volute, lower speed, less wear

By increasing the size of the volute, we've reduced the speed at which the medium moves. This lower velocity translates into lower wear.



### Extending seal life - Spin-Out™

Spin-out is a patented technology that protects the outer seal from abrasive particles. With its spiral groove, Spin-Out expels grit and other solids from the area around the seal.



### Seal protection - second-line defenses

The hub of a Flygt impeller is equipped with pump-out backvanes that, like Spin-Out, expel abrasive particles. In addition, an isolation zone takes the pressure off the mechanical seals.



### Easy and safe seal replacement - Plug-in™

Plug-in is a seal unit that eliminates the risks associated with incorrect installation and careless handling. This seal unit provides a perfect fit and faster, simpler replacement. Plug-in also protects the seal surfaces from contaminants during disassembly and mounting.

### Pumping lower for cleaner sumps

With the help of internal/external cooling, a Flygt pump can continue pumping down to very low slurry levels, helping to prevent sediment build-up in a sump.



### Modular motors and volutes - optimum pumping efficiency

With a wide range of pumps, plus a flexible modular system, Xylem can supply exactly the right pump for any application. This means you can mix and match motors with different hydraulics to get the exact performance you need, instead of having to buy a larger pump than is really necessary.

### Early warning system increases reliability

An inspection chamber between the seal unit and the bearings has a built-in sensor for early detection of any fluid ingress. This reduces the risk of subsequent problems - much like the "Check engine" warning light in your truck.

### Compact, portable, easy to install

Flygt submersibles are compact, integrated units that are designed for moving from place to place. They are slim, low weight and easy to install. And because Flygt pumps can start up to 30 times per hour, they can operate in smaller sumps than cantilever pumps.

### Powerful agitator for heavy slurries

When pumping coarse and heavy slurries, the unique Flygt agitator produces a powerful downward thrust that forces solids into suspension.



### Flygt SUBCAB® for submersible pumps

SUBCAB® has been specially designed for submersible pumps and mixers. It gives you long dependable performance thanks to highly resistant materials and superior mechanical strength. SUBCAB® is approved for explosion-proof and mining applications.

### Accessing 5500 pumps

The drive unit and wet end of the 5500 series are easily separated for fast access to wear parts thanks to a back pull-out function. The 5500 series also features a high chrome inner volute lining; in combination with the split-casing design of the outer volute, the lining is easy to replace.



# No compromise – get the best pump for the job

With a wide range of pumps, plus a flexible modular system, Flygt can supply exactly the right pump for any application.

**Flygt slurry pumps at a glance:**

- Flow: 30–320 liters per second
- Head: 10–88 meters
- Throughlet: 36–60 mm



## Specifications

	5100 211	5100 251	5100 300	5150 300	5150 350	5520	5530	5570 600	5570 700
Voltage, V	400	400	400	400	400	400	400	400	400
Rating, [kW]	7.5–13.5	15–22	22–45	30–45	50–70	3.1	5.9	58–105	100–215
Rated current, A	9.4–28	17–41	25–82	32–82	59–132	6.3	7–12	118–200	202–395
Discharge Ø, in	4"	4"	4"	6"	6"	4"	6"	8"	8"
Strainer hole, mm	30	30	30	36	36	20	30	30	30
Max height, mm	978	1124	1296	1410	1537	848	848	1675–2068	1829–2312
Max width, mm	547	547	595	875	875	478	632	983–1225	983–1225
Weight, kg	215	277	585	585	817	122	203	1190–1350	1700–2000
Internal cooling	•	•	•	•	•	–	–	–	–
External cooling	•	•	•	•	•	–	–	•	•
Agitator	•	•	•	•	•	–	•	•	•
Warm liquid 70°C	•	•	•	•	•	•	•	–	–
Ex version	•	•	•	•	•	•	•	•	•

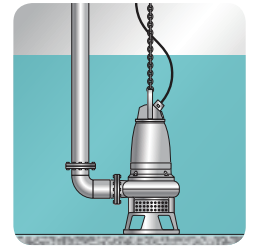
With reservation for changes. For additional specifications, see product technical documentation.



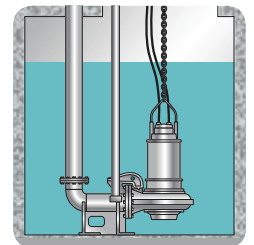
Flygt pumps are modular. In other words, you can mix and match motors with volutes to get the exact performance you need. No compromise. So, for example, if you are pumping high density slurry, you can select a larger motor but still specify the right size hydraulics for the head and flow of your application.



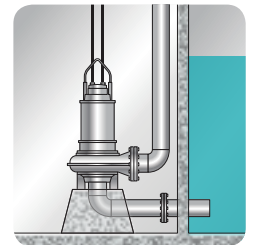
## Methods of installation



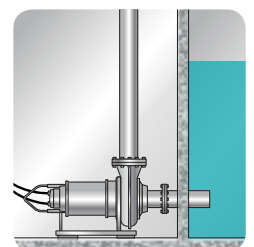
**S: Portable wet.** Easy to install and easy to move from sump, to basin, to tank.



**P: Semi-permanent wet.** Cost-effective wet pit installation on guide-bars with minimal structural costs. (Flygt 5500 series only.)



**T: Permanent dry.** Flood-proof solution for wet well/dry well or in-line pumping systems.

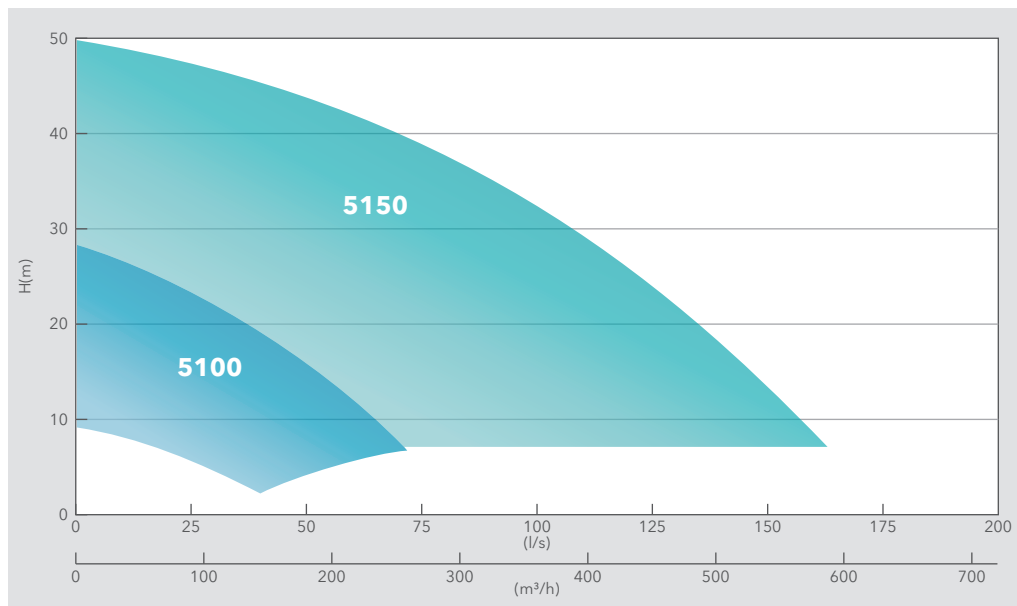


**Z: Horizontally-mounted permanent dry.** Well or in-line installation with flange connections for suction and discharge pipe work. (5500 series only.)

## Performance

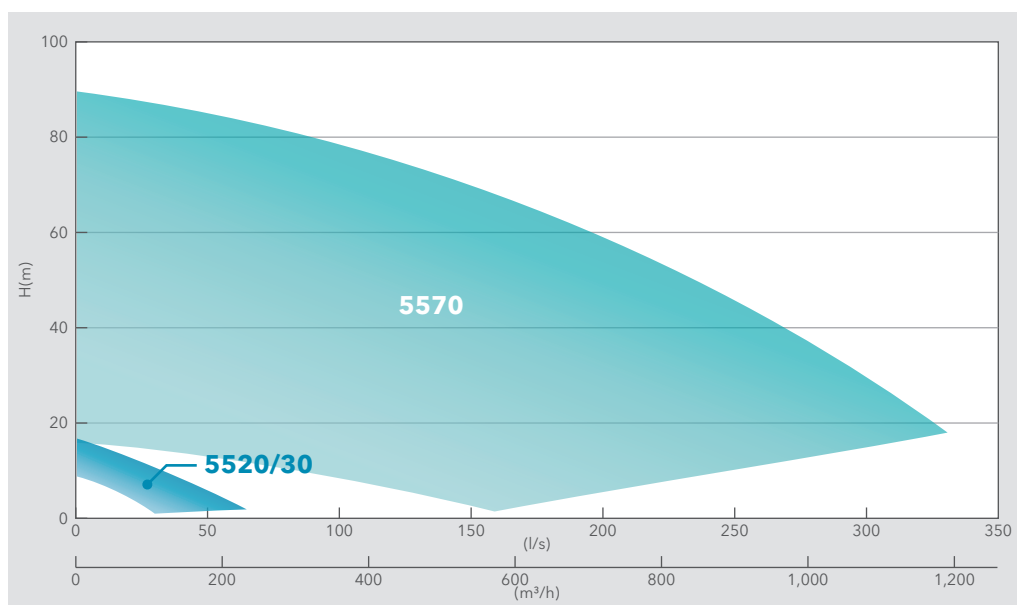
### 5100 series

50 Hz



### 5500 series

50 Hz



Composite curves for comparison purposes only. Consult engineering data for exact flow and head capabilities.

# The back-up team



## The machine that fights gravity

With over 200,000 mixer installations around the world, and over 50 years of experience designing mixer applications, we know how to counteract the effects of gravity and resuspend settled solids. For sumps where an agitator does not cause enough turbulence - because the sump is too wide or the slurry too heavy - Flygt submersible mixers have all the power you need to keep sumps clean. The mixers can either be mounted on your slurry pumps or separately on sump walls.

## The agitator designed by the mixer experts

Many agitators have a limited effect. This is because they create a radial flow that stirs the fluid but does not create enough turbulence to resuspend heavier solids. But the unique design of Flygt agitators - the result of our advanced mixing knowhow - creates a strong vertical thrust which forces settled solids into suspension.



## Monitoring and control

You can optimize the performance of your pumping operations with Flygt monitoring and control products. They help reduce stress on pumps, valves and piping, while boosting the reliability of your equipment. For example, built-in thermal contacts and leakage sensors automatically signal an alarm or stop the pump from running.

# Xylem TotalCare

**Xylem TotalCare** is a comprehensive, integrated portfolio of services designed to ensure that your water and wastewater equipment keeps running at its best. Our team of knowledgeable and highly skilled technicians are experts in drainage and slurry applications. We take pride in our ability to help customers overcome challenges and optimize operations by providing the right solution every time.

Our service network spans 150 countries and chances are we have a workshop close to your operations that can support you with application engineering, maintenance, pump repair, spare parts, turnkey project management, and more. We look forward to hearing from you.

Find out more about TotalCare services at [xylem.com/totalcare](http://xylem.com/totalcare)



Design & Consultancy



Installation & Commissioning



Maintenance Contracts



Repair & Maintenance



Monitoring & Supervision



Inspection & Auditing



Plant Operation & Maintenance



Parts & Logistics



Rental & Onsite Services



Asset Refurbishments



Training & Technical



Financial Solutions

(All services may not be available in all countries. We are constantly adding services so please check availability with your sales representative.)

## Slurry questionnaire



### Pump duty

- Required flow [l/s, USgpm, m<sup>3</sup>/h]: \_\_\_\_\_
- Static head + Pipe configuration
  - Static head [m, ft]: \_\_\_\_\_
  - Pipe length [m, ft]: \_\_\_\_\_
  - Inner diameter [mm, inch]: \_\_\_\_\_

### Information about the slurry

- Particle size [d50]: \_\_\_\_\_
- SG of particles: \_\_\_\_\_
- Concentration by weight/volume [%]: \_\_\_\_\_
- SG of slurry/mix: \_\_\_\_\_

# Xylem ['zīləm]

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

We're 12,000 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to [xylem.com](http://xylem.com)



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[www.flygt.com](http://www.flygt.com)