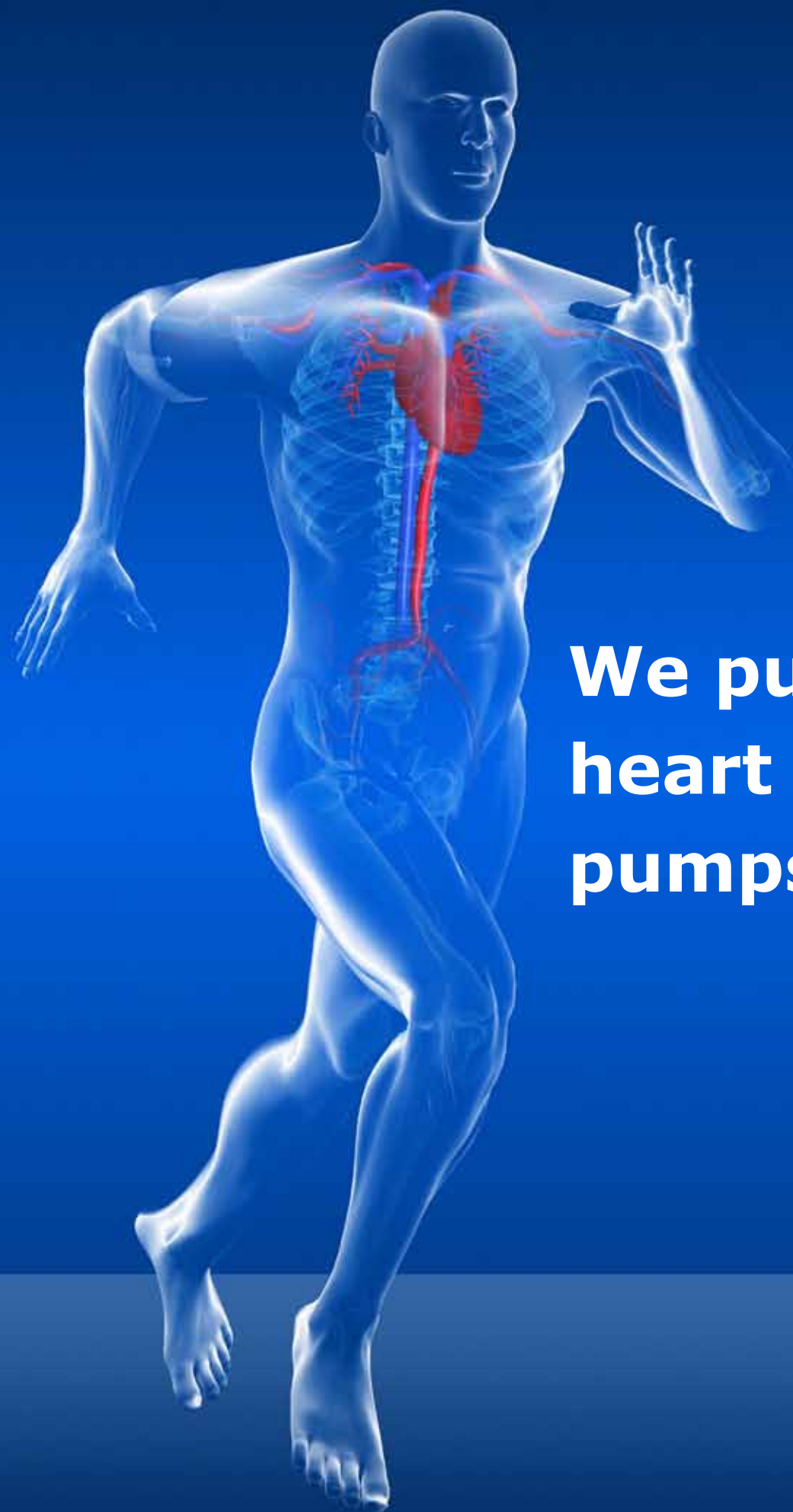




VERDER SOLUTIONS FOR SLUDGES & SLURRIES

Verderflex Peristaltic Hose Pumps

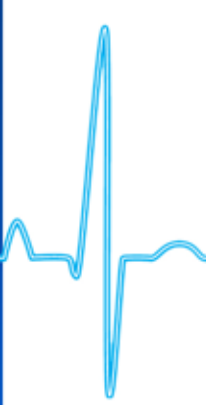
Verderhus screw channel pumps



**We put our
heart into
pumps**

Verder Solutions for Sludges and Slurries

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Verder's smooth operation at the RPM Waterval Smelter

Robday Mining Supplies, agents of Verder Pumps SA (Pty) Ltd, provide mining supplies to most of the mines in the Rustenburg area. Of these, the Angloplat operation has 3 running VF125 pumps at their Waterval Smelter plant.

With the change of processes at the smelter and the need for reliable quality pumps, Div de Villiers, Engineering Specialist at the Waterval Smelter, took into consideration the Verder range of pumps which are renowned for their durability, and are able to withstand the demand for the capacity for the pumping of slurries.

VERDERFLEX®

After a strategic consultation with Robday Mining Supplies, three VF125 pumps were acquired for the plant. The offloading pump, used for transporting the concentrate (SG 1.5) from the trucks to the tank, previously took one hour 45 minutes, whereas the offloading has been cut right down to 20 minutes.

The conditioner pump, working the hardest, provides circulation within the process, keeping the slurry in suspension and ensuring no sediment to settle. The transfer pump transfers the slurry (SG 1.7) 600m to the filter plant.

The conditioner pump works approximately 10 hours day the other two pumps only operate 4 to 5 hours a day when the slurry needs to be pumped. The pumps are limited to 50m³/h for SG of 1.7 even though the pump has a capacity to pump up to 80m³.



Mr. Gresse who has been with the tollbay smelter plant for 11 years says that the pumps are operating smoothly, with only the regular maintenance that has to be performed on the hoses. "We are extremely happy with pump's operation." he confirms.

Due to the increase in demand on the pumping of slurries at the smelter, de Villiers has advised Robday that a second tollbay plant is on the cards by the end of the year.

This new plant is expected to be built next to the existing plant and be double in size, requiring the use of 6 VF125 pumps to accommodate the capacity.

Moreover, de Villiers is so impressed by the quality of Verder's pumps that over the next few months Verder's range of pumps will replace the existing competitor ones when coming across major repairs and/or modifications at the smelter.

In the 17 years that de Villiers has been with Anglo Platinum, he says that he has never received such outstanding service, as he has from Robday Mining Supplies.

"We are in an extremely fortunate position to be receiving such professional expertise and product knowledge from Robday.

Since becoming the plant's preferred service provider eight months ago, the plant has benefited tremendously from the sound pumping knowledge from the mining suppliers," concludes de Villiers.

Furthermore, with the recommendation from Robday, a VF100 pump was recently delivered to the UG2 Concentrator, the newest plant in the area by the same operation.



"This is the first of the Verder range of pumps at the particular plant".

In time, the durability of Verder's quality pumps will break the competitor stronghold at the plant," believes Lamb.

For close to 60 years the Verder Group has been providing pumping solutions to industries all over the world. The group is known of their high quality products, innovative

technology and above all their knowledge of the industry it supplies.

The VF125 pump, the largest in the Verderflex® peristaltic range, has a 125mm hose inside diameter, and can pump at flows of up to 80m³ per hour and can cope with the toughest of pumping tasks, such as the platinum slurry at the Waterval Smelter plant, with the greatest of ease.



Peristaltic hose pumps for purification of cobalt

Cobalt is a non-metallurgical metal which is being used for the production of Alloys for the ceramic and the glass industry (as a pigment). Also in the paint and lacquer industry cobalt is used as a pigment.

Cobalt is a non-metallurgical metal which is being used for the production of Alloys for the ceramic and the glass industry (as a pigment). Also in the paint and lacquer industry cobalt is used as a pigment.

Verderflex peristaltic hose pumps will fulfill an essential role at refining the cobalt. The hose pumps are used for the transfer of sulfuric acid solution (30%) and ammonia (25%) from the storage and dilution tanks to several reactors and baths. The peristaltic hose pumps will pump these fluids, and especially the sulfuric acid, to rinse the cobalt and to eliminate impurities and separate the cobalt from other materials such as nickel, iron and arsenic in the ore.

This stage in the production process is called electrolysis. The electrolysis ensures that the cobalt is being produced purer and more concentrated.

The capacity of the peristaltic pumps must be adjusted continuously to the pH value of the mined cobalt. In this way the exact concentration of sulfuric acid for exactly that



specific quantity of cobalt is being pumped. To achieve this precise dosing automatically the pump speed is controlled by a frequency control, that is driven by a pH meter.

Feed pump for filter press

The process rinsing water, left over from the band filtration process, results in a filter cake with residues. The fluids –acidic and abrasive - are caught in collection basins. Another

Verderflex peristaltic hose pump functions as a feed pump for a centrifuge. A very fine powder is separated from the process waste water.



Cost savings and boost production thickener transfer

Cost savings and boost of production was seen at a precious-metal producer's concentrator upgrade project, near Rustenburg, where VPSA was required to upgrade the thickener transfer pumps for higher production capacity, says VPSA consultant Daan Louw.

VERDERFLEX®

The upgrade was possible as the pumps are able to pump slurry with 1,7 specific gravity and at a flow rate of 60 m³/h over a distance of 690 m, with a height of 30 m. This was the most difficult application for a peristaltic pump that VPSA ever had to deal with, he says. The VF125 thickener pumps resulted in cost savings and increased production capacity, explains Louw.

Durable hoses

Process engineering company DRA (then Vhumbanani) was appointed project engineer on the project and approached VPSA to assist in the design of six thickener transfer pumps.

"No other pump on the market is able to transfer the slurry without a second pump station, which would come at a significant cost to the mine and would probably take more time to process," says DRA project engineer Thys de Beer.

There are currently 24 VF125 pumps operating at 37 kWh at the platinum processing plant. Installing pulsation dampeners help decrease the pressure build-up in the pipeline, says Louw.



Reducing downtime, decrease maintenance

The build-up in the hoses is eliminated by using rubber Verderflex hoses that are designed to increase life expectancy and production performance. The Verderflex hose pumps are designed to handle tough operating conditions; they reduce downtime, decrease maintenance

costs and provide easy operation and reliable solutions in difficult pumping environments.

Industrial machinery and equipment company Robday Rustenburg provided the maintenance for the VF125 pumps to ensure efficient operation, he concludes.



Extreme duty Lime Slurry application

Carolina Stalite Company uses coal-fired rotary kilns to remove impurities from slate. Due to its lightweight nature, this purified slate, also called expanded slate, has a variety of uses including masonry, bridges, and other structures.

VERDERFLEX®

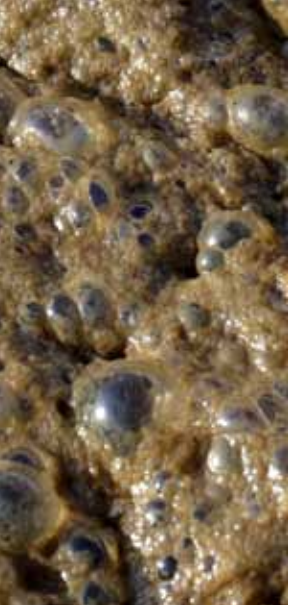
As with any coal-powered operation, EPA-regulated byproducts of combustion are released and must be dealt with. The plant had been using mechanical double-diaphragm reciprocating pumps to treat the flue gas with lime slurry. This pumping application is particularly tough due to pressures over 100 psi and the abrasive nature of lime slurry.

The slurry pumps were prone to failure. If a pump went down, the plant had only two hours to get the pumps operational, otherwise they would have to shut down due to EPA regulation.

The plant lost thousands per hour of downtime, plus the massive energy costs associated with bringing the plant down and back up. They needed a better pumping solution.

Verder provided a Dura 35 peristaltic hose pump to replace the existing diaphragm pumps. Dura-series hose pumps from Verderflex offer several unique features including a vertical motor, one-piece flange assembly, and extended hose life. Verderflex pumps are helping the plant save money and energy by reducing downtime.





Xstrata marvels at Verderflex muscle! Pumping Ferrovanadium

Located in Bethanie, North-West Province of South Africa, Xstrata's Rhovan vanadium facility relies on the most appropriate and reliable equipment to run its impressive Ferrovanadium Plant constructed in 2002. Annual production capacity at Xstrata Alloys Rhovan vanadium operations' pentoxide production is 22 000 lbs and 6 000 kg Ferrovanadium.

VERDERFLEX®

"A pump so reliable - it's only downtime is for hose replacement and annual plant maintenance!" claims Xstrata Alloys Rhovan's Acting HOD Christelle van Vuuren, regarding the Verderflex pump installed at the operation's precipitation plant.

All vanadium in the ore occurs in solid state in the titaniferous magnetite. After the first stage of processing, the magnetite concentrate is subjected to a conventional roast leach precipitation process for the recovery of vanadium. To achieve the desired final product quality, Silica (SiO₂) is removed from the pregnant solution. Precipitation of Vanadium from the pregnant solution is achieved by the addition of Ammonium Sulphate ((NH₄)₂SO₄).

The vanadium recovery process makes use of an evaporation process to recover sodium sulphate salt from the barren solution after precipitation. This salt is recycled back to the kiln, displacing the need for a portion of the sodium carbonate flux requirement.

The VF 40 pump is used to pump the barren slurry at the plant, at approximately 6 – 8 m³/hr at 60% solids handling. Abrasive mining slurries have sub-micron solid contents in excess of 80% with slurry SGs in excess of 2.0. Only hose pumps can pump such dense fluids whilst maintaining high levels of plant availability unlike centrifugal pumps which suffer from continuous downtime and are unable to pump such high SG slurries; lower plant performance.

Since the plant was commissioned, the operation has replaced other hose pumps for the easier to maintain VF pump, due to its quick maintenance capabilities. "With no gland water used by the operation, the pump can run dry, and the rotor design and flange arrangement makes the pump a hit at our plant for easy maintenance," says Harrison.



"It just runs and works when you need it to," confirms Van Vuuren. "The pump is only 'offline' for spare part replacement and planned plant maintenance. Quite simply: a reliable pump!" she adds.

VF pumps are easy to maintain, with hoses the only wear part in the pump. VF hoses are specifically designed and manufactured to minimise the effect of fatigue, resulting in an extremely long hose service life.



Vanadium pumping from titaniferous magnetite

A vanadium facility, located in South Africa is winning vanadium from titaniferous magnetite. The titaniferous magnetite is processed in various stages, using a.o. precipitation tanks and various positive displacement and transfer pumps. Vanadium occurs naturally in about 65 different minerals and in fossil fuel deposits. It is produced from steel smelter slag, the flue dust of heavy oil, or as a byproduct of uranium mining. It is mainly used to produce specialty steel alloys such as high speed tool steels.

Vanadium is found in many organisms, and is used by some life forms as an active center of enzymes. Magnetite and vanadium are of a very abrasive composition causing problems in the lifetime of process materials such as in wetted parts sections of pumps.

All vanadium in the ore occurs in solid state in the titaniferous magnetite. After the first stage of processing, the magnetite concentrate is subjected to a conventional roast leach precipitation process for the recovery of vanadium. To achieve the desired final product quality. Then Silica (SiO_2) is removed from the processed magnetite concentrate (pregnant solution). Precipitation of vanadium from this processed magnetite concentrate is achieved by adding Ammonium Sulphate ($(\text{NH}_4)_2\text{SO}_4$).

60% solids slurry

The vanadium recovery process makes use of an evaporation process to recover sodium sulphate salt from the barren solution after precipitation. This salt is recycled back to the kiln, displacing the need for a portion

of the sodium carbonate flux requirement.

Barren slurry has to be pumped with approx. 60% solids handling, which is much too high for some pump types.

Flow range is about 6 – 8 m^3/h . The ideal solution is a peristaltic pump. Because of the construction of the Verderflex peristaltic hose pump (only the hose is in contact with the wetted parts of a pump, so there are no moving parts to clog and no chance of cross contamination) a Verderflex VF40 peristaltic hose pump was chosen.

The Verderflex VF40 pump is capable of flow rates of $7.5\text{m}^3/\text{hr}$ and pressures up to 16 bar. Like all hose pumps the only wearing part is the hose itself, keeping maintenance time to a minimum. Abrasive mining slurries have sub-micron solid contents in excess of 80% with slurry SGs in excess of 2.0.



“Only hose pumps can pump such dense fluids whilst maintaining high levels of plant availability, unlike centrifugal pumps which suffer from continuous downtime and are unable to pump such high SG slurries.”

Thickener underflow slurry

Three applications ranging from the very abrasive to mildly abrasive slurries from concentrator. Concentrate Slurry, Abrasive materials from three areas including very abrasive high grade nickel concentrate, mixture of copper and nickel and copper slurry with low nickel, flows up to 22 m³/h, up to 72% solids solids density of 4.29 - 4.97.



Pumps installed with expansion joints and flexible hose on suction to mitigate impulse losses on the pump, with an air dome (80 liter volume) and flexible hose on the discharge to mitigate pulsation effects on the pump and line.

Pumps are running with upwards of 4000 hours service on the hose. In the Metallurgist's opinion the slurry is very abrasive and these pumps have replaced SRL (Soft Rubber Lined) centrifugal units that were continually being repaired as a result of the abrasiveness. They have saved well over 100 hours per year of downtime at the plant and exceeded their goal of 100% throughput.

Three Verder VF 80 Series hose pumps with Natural Rubber Hose, expansion joints to mitigate impulse loss on suction side and air dome on discharge of each pump. Three more standby units are currently being commissioned as part of independent concentrate pumping stations.





Lime dosing solutions for water treatment plant

Progressive cavity pumps no match for peristaltic technology

The Sioux Falls Water Purification Plant in South Dakota USA, had always relied on gravity to feed slaked lime slurry to their softening basins. The staff decided to give gravity a helping hand by trialling a pump to move the slurry more effectively.

VERDERFLEX®

Lime slurry is a dense product to transfer with a high solid content of up to 35%. Due to the slurry's abrasive nature which causes wear on progressive cavity pumps with consequent downtime and operating costs, Sioux Falls opted to use a peristaltic pump for the transfer process. Peristaltic or hose pumps use alternating compression and relaxation of a reinforced hose to push liquid through pipe work. The resulting vacuum, caused by the repeated cycle, draws more product into the hose.

Accurate

Peristaltic pumps are accurate and repeatable dosing pumps where the pumped product is totally contained within the hose, eliminating the possibility that any moving parts can clog or corrode. This makes a peristaltic pump the perfect choice for pumping high solid content slurries such as lime.

Sioux Falls' largest obstacle when deciding on a suitable pump was the amount of available space. They wanted to continually pump approximately 2,350 l/hr which would normally mean a sizeable pump with a large motor and gearbox.

The solution

The solution was the compact Verderflex Dura 35. Verderflex

are specialist peristaltic pump manufacturers and part of the Verder group of companies, combining over 50 years experience with a worldwide presence, Verderflex have developed a peristaltic pump like no other: the Dura's unique space saving design, with a vertical motor and gearbox, dramatically reducing the pump footprint and saving space. The Verderflex Dura 35 is capable of pumping up to 5.5 m³/hr at pressures up to 12 Bar, more than enough for Sioux Falls who wanted to pump at just over 4 Bar, 24 hours a day and 7 days a week.

Durable hoses

Although the pump has been running continuously with the same hose for over 8,000 hours, all Dura pumps are designed with quick and easy maintenance in mind. When Sioux Falls finally need to change the hose they will find the simple taper fit flange design makes hose changes easy, keeping downtime to a minimum.



Introducing a Verderflex peristaltic pump at Sioux Falls water municipality's treatment plant has proved to be such a great success that additional Dura 35 pumps have already been installed.



Peristaltics replace submersible pumps for PAC

Often overlooked, the reliable peristaltic pump has again proved its worth at Coddle Creek Water Treatment Plant, eliminating the mixed results of a few years previously experienced using a submersible pump dosing Powder Activated Carbon (PAC) from a wet well. After more than three submersible pumps failed in just over a year the maintenance and operations management sought an alternative.

The problem was the location of the pump: in the pump room 8 metres above the bottom of the well and additionally, the pump must also be able to resist the PAC's abrasive nature. So the plant called on Verder Inc to help find a solution.

Lance LeBrun, Verder Inc.'s Regional Sales Manager for the Carolinas, recognised that the best pump for the job would be a Verderflex peristaltic pump.

The simple but highly effective peristaltic process results in a pump with a high dosing accuracy, a high suction lift and a low cost of maintenance. Because the fluid is completely contained within the reinforced hose there is no possibility of parts clogging, the only wearing part is the long life hose itself, which is quick and easy to change, keeping downtime to a minimum.

Using a flow paced controller, the Verderflex hose pump can transfer and dose variable flows in accordance with the plant's demand and by their very nature these pumps can gently pump abrasive suspensions such as PAC and lime slurries without any

check valves.

Given the flow rate, suction and discharge pressures needed, Verder Inc chose the Verderflex VF15 hose pump with its 15mm diameter natural rubber hose. The VF15 is capable of short term flow rates up to 600 l/hr and continuous flows of 375 l/hr at pressures up to 12 Bar. Use of the high pressure rotor and Verderflex's unique reinforced hose technology creates excellent suction lift and easily manages the 8 metre lift needed by Coddle Creek.

3700 hours running hose

The Verderflex VF15 pump has been installed for over a year and the plant have now had 3,700 hours running on the same hose without problems.

Verderflex manufacture a large range of peristaltic pumps for many process applications, from small custom tube pumps used in OEM equipment through to the VF125, the largest high pressure peristaltic hose pump in the world and SCADA controlled Smart tube pumps that accurately and consistently dosing process chemicals.

During difficult economic times customers are increasingly



looking for reliable, low cost of ownership engineered solutions over cheaper but high maintenance alternatives and recent studies indicate that more and more customers will be using peristaltic technology in the future.

Dosing hypochlorite in new wastewater treatment plant

The City of Eagan in North Minnesota, USA required a pump capable of accurately dosing 15% sodium hypochlorite or 'hypo' for their new wastewater treatment plant. Hypo has outstanding disinfection properties, used in wastewater treatment to kill off bacteria before being discharged back into the environment, and in water treatment as one of the primary methods of drinking water disinfection.

Hypochlorite is a challenging product to pump as; when being pumped, Hypo tends to off-gas, causing some pump types like diaphragm pumps to vapour lock. After evaluating several pump choices from a number of manufacturers, they decided to use the Verderflex VF10 peristaltic hose pump for the job. The ten pumps will be put to immediate use in this new area of the treatment plant. Each Verderflex VF10 pump is capable of flow rates up to 48 US GPH and at pressures up to 175 PSI.

Verderflex pumps can pump both gas and liquid, ensuring the liquid stream receives a consistent dose. Peristaltic pumps are the perfect pump choice for dosing sodium hypochlorite and Verderflex pumps can be found in wastewater treatment plants worldwide.

Variations in hose types

The fluid being dosed is kept totally enclosed within the rubber hose which is then compressed by a rotating shoe, forcing the liquid inside along. Upon restitution of the hose the resulting vacuum draws in more



liquid. This process is known as peristalsis and is what makes the peristaltic pump the first choice for liquid metering. Variations in hose type allow for low strength and even high strength hypo dosing.

Long hose life

The wastewater plant needs to run as cost efficiently as possible and the City of Eagan were impressed with the long hose life

given by the Verderflex hose and the ease of maintenance when the hose needed to be changed. "We were really pleased with the installation at the City of Eagan Wastewater Treatment Plant. There were many other pumps considered for this application, but in the end the ease of maintenance, the proven reliability, and the exceptional hose life of Verderflex's superior design won out. As a result of

this installation, a similar project located nearby chose Verderflex for these same reasons and a third customer in the state just recently purchased a new Dura after hearing all of the positive feedback and new features of this design. These pumps have certainly been a success for us

in this industry". – Tom Eisemon, National Sales Manager, GPM Pumps (Master Distributor for Verderflex in US).

Because of the pumping process used by peristaltic pumps, the hose is the only part that ever comes onto contact with the fluid being pumped. Not only does this

mean that the pump is hygienic and leak free, it also means that there are no moving parts to become clogged or damaged. The only maintenance required is to change the hose, which is done quickly and efficiently, keeping downtime to an absolute minimum, saving costs and increasing profits.

Dura Hose Doses Calcium Hypochlorite

Dura replaces calcium hypo diaphragm pump 3 x Dura 25 with PP flanges replaced problem vapour locking diaphragm dosing pumps Calcium Hypo diaphragm pumps. Sterilisation of water supply is dependent on Hypochlorite being dosed and this water is then supplied to one of Johannesburg's largest informal settlements.



Dosing and Transfer of Refuse Leachate

The Suzhou Waste Incineration Plant have installed 12 Verderflex® peristaltic pumps as part of the leachate process and injection system. The abrasive leachate is pumped from the collection reservoir, through an automatic cleaning filter and collected in a draining reservoir.





Copper Thickener slurry & clarify transfer pumps

Gunpowder Aberfoyle Copper Mine, Queensland, Australia, successfully uses a total of 18 Verderflex hose pumps at their copper ore mining plant (14 x VF65s & 4 x VF125s)

The process

Copper ore is crushed and milled and mixed in a tank with the leaching solution. Copper dissolves into the leaching solution and is then electrolytically recovered. The residual solution still contains a significant amount of Copper and is separated from the leachate using a vacuum belt filter, prior to heating under pressure and being autoclave mixed to increase Copper recovery rate.

Thickener / Clarifier Transfer Pumps

2 variable speed Verderflex VF125 peristaltic hose pumps, fitted with 37 kW motors and with a nominal speed of 17 rpm but capable of flow rates up to 50 m³/hr (25 rpm), pump the post autoclave solution from the thickener / clarifier into leach residue storage tanks.

Hose Changeovers

When one VF125's hose fails, a standby Verderflex VF65 starts up and the other VF125 is temporarily speeded up to maintain the same flow as was delivered with the pair of VF125 pumps. Resulting in process continuity.

Filter Feed Pumps

2 VF125 pumps, and a stand by VF65 pump, pump the 40% solid content slurry from the storage tank over a vacuum filter again.

In a 3 stage process the liquid is treated in leach thickeners (CCD1, CCD2, CCD3) to remove the solids from the solution. Each thickener has 2 VF65 pumps to pump the solids back in the leach residue filter storage tank. Finally, the thickened solution is pumped into the electrolyte units.



5 other frequency-controlled VF65s, with 7.5 kW motors and nominal speeds of 28 rpm, are used across the plant and a further Verderflex VF65 pump acts as a standby spare.

- High Solid Content
- Low Maintenance Costs
- Abrasion resistant pumps
- No moving parts in the liquid stream
- Dosing (Sampling) Consistency
- Totally enclosed hose

Using these processes the mine recovers over 98% of the copper from the base ore.

Rectifying the pH balance of mine water

After decades of uncontrolled industrial (mining) activities, water supply is under serious threat. Studies show that acid water levels in the country's mines are rising at a staggering average rate of 0.59 m/day. The water situation is in fact threatening the population's survival. At the heart of resolving this problem are the treatment of water and wastewater.

Peristaltic dosing pumps are used as part of the process to rectify the pH balance of acid mine water. It highlights a successful implementation at a uranium wastewater treatment plant, focusing on but not limited to: the cost of ownership; plant performance (plant availability and reliability); and dosing accuracy.

The impact of acid mine drainage (AMD) is devastating, with far-reaching and long-term effects on the environment. According to recent research, AMD could not only affect South Africa's quality of water, but also poison food crops, destroy heritage sites and lead to a decline in agricultural production with related job losses, to name but a few.

Peristaltic pumps for dosing lime

According to the experts consulted by the Department of Water Affairs, the most suitable process to consider in dealing with the current AMD issues is the ABC (alkali-barium-calcium) process, developed by South Africa's Council for Scientific and Industrial Research (CSIR),



which consists of the following steps:

1. Lime and/or CaS pre-treatment
2. Barium treatment for sulphate removal
3. Sludge processing.

This is the most comprehensive treatment that will ensure that the treated water is fit to be

introduced back into nature but is not necessarily suitable for human consumption.

The nature of the medium being pumped is an important factor when considering pump selection for a specific application. When pumping lime, the high viscosity of the medium often causes



pumps to clog up, resulting in a maintenance nightmare.

Peristaltic pumps are a type of positive displacement pump used to convey a variety of fluids. The fluid is contained within a flexible hose fitted inside the pump casing. The actual pumping principle, called peristalsis, is based on alternating compression and relaxation of the hose, drawing content in and propelling product away from the pump, in the same way that food is pumped through the body. This process makes a peristaltic pump an accurate dosing or metering pump, with an equal amount of liquid dosed each time.

pH correction

Correcting the pH is a very specific process and the pump used for dosing must be very accurate. Peristaltic pumps have a linear flow-speed characteristic and excellent

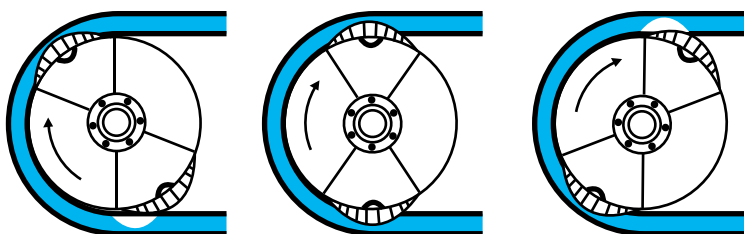
repeatability, making them the most accurate solution available.

The liquid being pumped never comes into contact with any moving parts because it is totally contained within the reinforced hose. A rotating shoe passes along the length of the hose creating a total seal between the suction and discharge sides of the pump. As the pump's rotor turns, this sealing pressure moves along the hose, forcing product to move away from the pump and into the discharge line. Where the pressure has been released the hose recovers, creating a vacuum, which draws the product into the suction side of the pump, the priming mechanism. Combining these suction and discharge actions results in a self-priming positive displacement pump, the

peristaltic pump. The perfect seal between the two sides of the pump means that there is no product slip; when coupled with the pump's linear speed-flow characteristic it makes peristaltic pumps ideal for dosing. Additionally, as the pumped liquid is totally contained within the hose, this makes a peristaltic pump an environmentally safe pumping solution with zero chance for contamination. This also reduces maintenance time as the hose is the only wearing part.

The pulsation effect means that solids are kept in suspension. Build-up in the hoses is eliminated by using rubber hoses that are designed to maximize life expectancy and performance.

Hose pumps are designed to handle these tough operating conditions, ensuring optimal process flow.



working principle of a peristaltic hose pump

Uranium mine





Dosing applications slurry

Three applications ranging from the very abrasive to mildly abrasive slurries. Concentrate Slurry and abrasive materials

Dosing Copperas Crystal at Kilroot Power Station

The Kilroot Power Station which serves Belfast required a dosing solution for the corrosive cooling water that was heavy in salts, resulting in the attacking of the filter screens and pipe channels. The dosing solution had to be a single turnkey package which could handle chemical in a crystal or liquid state, a mixing tank and pump rig.

Copperas crystals (solid Ferrous Sulphate FeSO_4) are mixed at a power station to form a liquid that is re-circulated and dosed by Dura 15 pumps to form a protective iron coating on titanium condensation tubes



Dosing & circulation of lime

The initial installation required a solution to circulate lime mixture in the tank. Verder UK installed a Verderflex pump to keep the lime slurry blend mixed to the required state. This unit was specifically chosen due to the duty level the Verderflex hose pump could provide to circulate the fluid from the base to the top of the tank. The suction properties of the Verderflex ensured there were no dead spots in the base of the tank and the working principle guaranteed there were no blockages and a long MTBF. The homogenous state of the mixture meant less lime chemical was wasted in the tank and a consistent fluid was being delivered by the dosing system.



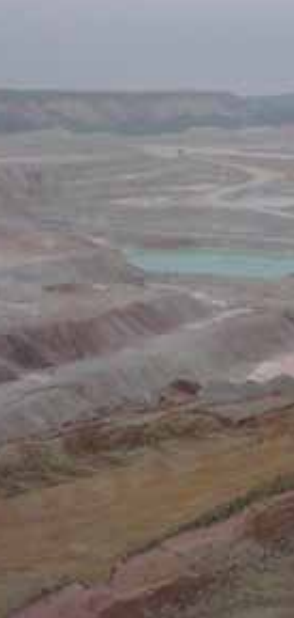
Dosing at Thames Water Crawley ST

Following the successful operation of an initial Verder system, the Verder UK Team provided a replacement dosing system for phosphate removal.

The system uses Verderflex Dura pumps for the delivery of the chemical. Verder UK provided Package Dosing Plant consisting control panel, dosing rig, pipework, valves, dosing hoses and kiosk assembled and tested at the Verder Service Centre.

The Verder UK Team commissioned the system and gave training to the Thames Water maintenance engineers and supplied a spares and maintenance plan.





Screw Channel pumps in slurry applications

Verderhus screw channel pumps are one channel centrifugal pumps, with the ability to pump up to 55% of solids.

Pumping Kaolin Slurry

Installation of the Verderhus running with Kaolinite Slurry in a 24/7 duty controlled by a VSD replacing a 2 stage PC pump with a last time of 3 months

Benefits

- Less wear
- less parts
- Smaller foot print
- Higher efficiency (less friction losses in the pump)



Thickener underflow pump in a 24/7 application

Pump with belt drive for an underfloor thickener in a 24/7 application. Pump model HSL250-200A with 10" inlet and 8" outlet.



Cooked abrasive liquid in Biogas plant

Pump installed at a Biogas plant. The liquid is 70-80°C cooked abrasive liquid.

- Flow rate 100 m³/h
- Head 24mWc
- Drive 7.5kW





Screw Channel pumps in slurry applications (II)

50% glycol, 50% silicon carbide slurry

Vertical spindle pump is without sealing able to run dry for slurry.

- SG 1.6-1.7kg/dm³
- Flow rate 9 t/h.

24/7 application of 50% glycol and 50% silicon carbide now running for 8 years. The last time that the bearings were changed was 2 years ago and the pump hydraulics was maintained many years ago the last time.



Paper Pulp containing recycled cotton

This pump is installed in the pulp and paper industry. The pump is pumping paper pulp containing recycled cotton and other remains of clothing such as buttons, zippers etc





Screw Channel pumps in slurry applications (III)

Feeding filter press pump for gravel slurry

Installation of a Verderhus pump replacing an Abel pump feeding a filter press.

- Pressure of 30mWc on a gravel plant replaced by a VerderHUS

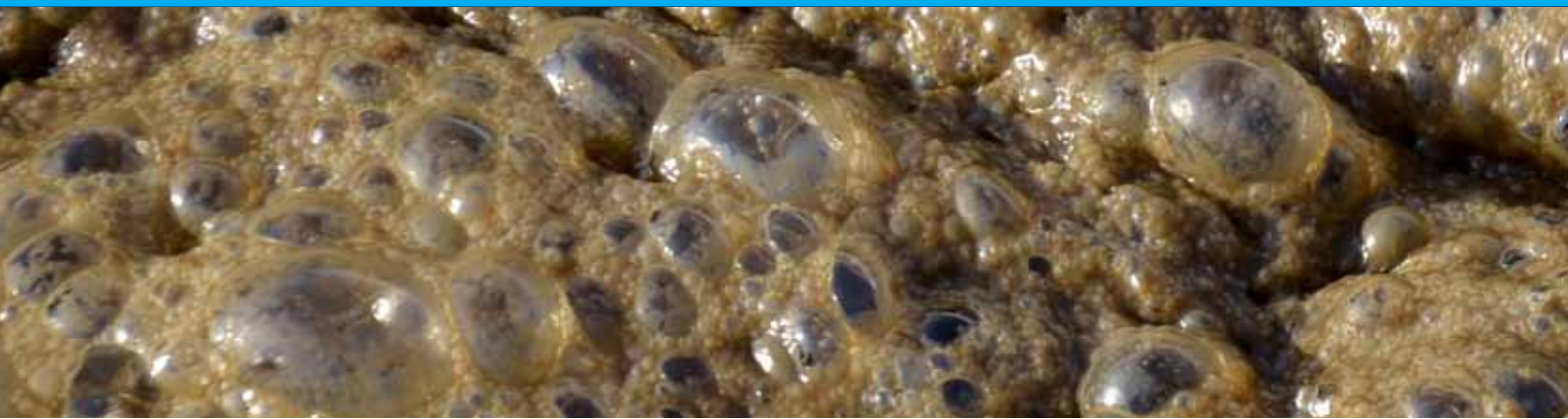
Benefits

- No pulsation dampener needed on suction or discharge side
- Smaller foot print without gearbox and belt drive



the replaced Abel pump





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