

# VERDERFLEX<sup>®</sup>

Pumping solutions for the water and  
wastewater industries

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Solutions in Pumping Technology



# The Water Industry

Globally, both clean and wastewater treatment facilities have common equipment requirements.

They should:

- perform as expected;
- have a low cost of ownership;
- be reliable, easy to maintain without specialist maintenance skills;
- resist everyday “real world” experiences such as ragging and solids.

In addition, when treating a liquid stream, pumps should:

- provide repeatable flow rates especially when dosing;
- have high levels of plant availability;
- resist abrasive wear;
- be controllable via plant control systems;
- be both easy to maintain and to require infrequent attention;
- not affect overall levels of plant performance;
- not cause conflicts with regulatory authorities.

## Lime Dosing and Mixing in pH and Odour Remediation Treatments



Lime, Kalic® or Kalkmilch is one of a group of wastewater treatment chemicals that are used to rectify the pH of wastewater discharges. Other chemicals include Ferric salts, Caustic Soda, Aluminium Sulphate, Ferrous Sulphide and Powder Activated Carbon (PAC). Many of these have common properties that make peristaltic pumps an ideal dosing solution because:

- they are particularly abrasive, creating continual wear problems for progressing cavity pumps leading to ongoing high stator replacement costs and frequent maintenance downtime;
- lime is relatively highly viscous, usually too viscous for diaphragm pumps, causing them to clog up resulting in continual maintenance requirements;
- Verderflex pumps have a linear flow-speed characteristic, ideal for feedback control systems, allowing precise control of the chemicals being dosed, minimising chemical useage;
- Verderflex pumps have a smooth liquid passage, there are no opportunities for product to settle and the peristaltic action keeps product in suspension rather than allowing settlement;
- product may be mixed on site - solids in the liquid stream are not a problem for Verderflex pumps;
- the Verderflex’s seal-free design eliminates leaks and the consequent risk of workplace contamination.

## Sodium Hypochlorite Dosing

Sodium Hypochlorite (Hypo) has outstanding disinfection properties and dosing with locally generated solution is one of the primary methods of drinking water disinfection and odour control solutions. It is also a challenging product for a pump:

- when being pumped, Hypo tends to gas causing diaphragm dosing pumps to vapour lock and the liquid stream is not treated;
- degassing kits, at best, allow such pumps to slowly recover dosing performance jeopardising consent levels;
- Verderflex pumps pump both gas and liquid and ensure all the liquid stream receives a consistent dose;
- Verderflex’s Hypalon® hoses will withstand up to 17% solutions and so can be used with both low strength and high strength Hypo generation systems.



## Dosing Polymers and Ferric in Coagulation Processes

"Ferric" and polymers are used to dose coagulants into clean water plants to remove peat, suspended solids and residual colours from clean water streams. In wastewater treatment, sophisticated polymers maximise plant throughput by increasing the solid separation rate allowing greater primary waste volumes to be treated per day:

- most polymers are highly shear sensitive;
- high shear rate pumping solutions increase coagulant costs, lowering plant efficiency;
- over-dosing causes coagulant to be re-circulated into the plant inlet stream, this reduces the effectiveness of lime treatment, additionally increasing the costs of this operation;
- in contrast, the gentle peristaltic action maximises coagulant performance by maintaining the particle size and increases overall plant efficiency;
- the linear flow-speed characteristic of Verderflex pumps allows accurate coagulant dosing rates, optimising chemical usage;
- abrasive products create continual wear problems for many pumps leading to continual maintenance downtime and premature pump failures;
- peristaltic pumps are abrasion resistant, so they provide reliable and predictable service.



## Filter Presses and Waste Minimisation



All water treatment plants produce waste, which has to be prepared for disposal, usually by filter pressing to minimise volumes and constrain the waste processing costs. Usually such waste is sent to landfill or incinerated giving a disposal cost based on the waste's weight and volume. Filter presses challenge traditional pumping solutions:

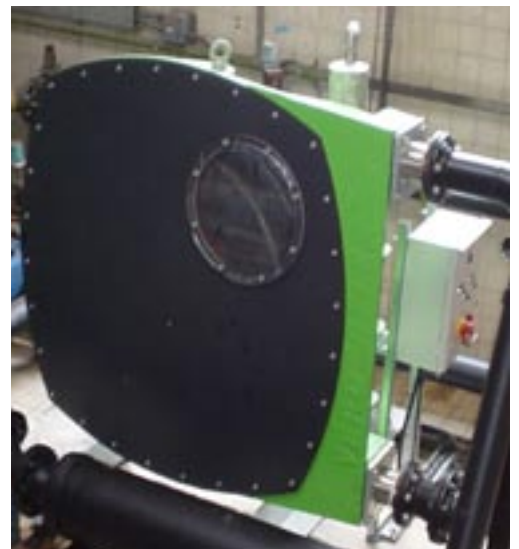
- the waste is abrasive, creating stator wear, slip and consequentially the pump's flow drops;
- traditionally, to maintain flow rate, the pump speed is increased and the pump is operated with the gland seals pressurised or "delivery on gland". This causes increased leakage and results in abrasive wastes wearing on the rotor's shafts;
- this creates variable suction performance and the suction pressure increases creating "Rat Holes" (water is pulled from above the top of the sludge blanket) in the filter press feed, increasing the water content (the weight) and the volume of the pressed waste;
- Filter Press operation costs are increased;
- Verderflex pumps give consistent suction performance and do not suffer wear;
- "Rat Holes" are eliminated, a more consistent, denser pressed waste is produced;
- Filter Press costs are reduced.

## Transferring Sludge

Wastewater treatment plant primary sludge pumps have to transfer whatever is in the sludge lagoon and this presents many problems, even after the use of screens to remove rags, paper and other modern day debris:

- traditional solutions such as progressing cavity pumps have high maintenance costs when rags become trapped around the stator;
- sludge can have a high grit content leading to persistent high maintenance costs due to abrasion and grit removal plants are also required;
- Verderflex pumps are abrasion resistant;
- they are a low cost of ownership solution, the only service part is the easily changed hose;
- Verderflex pumps will pump rags, so that the rag removal screen can be located after the pump.

To maximise digester performance, pumps have been fitted with turbidity monitoring systems so that low solid content sludge remains in the settling tank further increasing plant efficiency.



# The Verderflex Range

## The Verderflex High-Pressure Hose Pump Range



- Flows from 2 l/hour (0.2 US Gallons per Hour) to 90m<sup>3</sup>/hour (390 US GPM).
- Discharge pressures up to 16 bar or 230 PSI.
- Pumps can be supplied in either close coupled or long coupled (bare shaft) styles.
- System connections include DIN PN16, ANSI 150lb and JIS.
- Can be supplied with accessories including pulsation dampers, dosing controllers, even as complete dosing stations.

## The Verderflex Hose

- 11 standard hose sizes from 5mm (3/16") to 125mm (5").
- Verderflex pumps are designed to maximise hose life by optimising the hose's fatigue strength.
- Hoses are available in:
  - Natural Rubber for general purpose uses and abrasive chemicals including lime;
  - Nitrile Buna Rubber (NBR) for animal fats and similar wastes;
  - Food Grade NBR for food grade applications;
  - EPDM for aggressive chemicals such as Ferric Chloride;
  - Hypalon<sup>®</sup> for extremely aggressive compounds such as Hypo and some Polymers.
- Hoses have colour coded identification tape bonded into the outer cover during manufacture to clearly identify material type.

## Verderflex Smart Tube Pump



- Flows from 0.01 ml/min (0.0002 US GPH) to 10.2 l/min (161.7 US GPH)
- Maximum discharge pressures up to 4 bar (60 PSI)
- Four sizes of IP 55 Protected Digitally Controlled Programmable Multi Channel Tube Pumps
- Wide range of tube materials including Verderprene, Platinum Cured Silicon and StaPure<sup>®</sup>
- Easy-fit self adjusting Tube Saddle with intergral Saddle Status Detection (SSD)
- External interfaces : 0-10V, 4-20 mA, RS 232
- Optional leakage detection

StaPure<sup>®</sup> is a registered trademark of W L Gore

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