

Chemical Dosing
Package Plant Systems

Chemical Dosing

Chemical dosing is the delivery of a chemical substance at a controlled rate. This is crucial in water treatment activities such as phosphate removal or pH control as well as for making energy from organic waste.



The dosing process

A chemical dosing skid is the most effective way to dispense chemicals, using peristaltic or metering pumps attached to pipe work encased in a cabinet. Normally a chemical dosing skid will consist of two pumps operating as a duty/standby to ensure the dosing process is uninterrupted, should a wearable component need to be serviced. Chemical dosing skids are manufactured in accordance with site requirements and water company specifications as well as conforming to Wimes specification.

A chemical dosing system uses a dosing skid and control system to control the dose rate in an automated process determined by the pre-programmed dosing information or live measurement and feedback.

Industry Sectors

- Waste Water Treatment
- Clean Water Treatment
- Anaerobic Digestion
- Power Stations
- Mining
- Building services
- Public Infrastructure
- Food & Beverages

Verder Chemical Dosing

Our Systems & Services

Phosphate removal

Final effluent contains phosphates which cannot be discharged into the water course as the phosphate can cause problems with aquatic life. This is enforced by the UK Environment Agency.

The water companies must dose a chemical in order to remove phosphate, often this chemical is ferric sulphate or ferric chloride. It is important that the dose rate is accurate as to high a dose rate could result in a high iron content, which would result in a fine from the UK Environment Agency.

The amount of dosing will vary according to the time of day; for example in the morning when people use the toilet and bath or shower, or in the evening when they finish work. As a result, dosing pumps need to run quicker at these peak demand times and slower during the hours of sleep, producing a diurnal, cyclical flow.

pH buffering

Dosing chemicals to remove phosphates which often changes the pH balance of the final effluent. Sodium hydroxide or lime is often dosed alongside the phosphate removal to balance the pH.

The control and measurement of the pH level is directly linked to the dosing speed and control of the pumps offering accurate and real time correction.

Specification

Water companies will typically work to a standard specification and with

various reference sites. Verder UK have provided many successful compliant systems and work procedures for all water company sites.

By using existing capital equipment on site, Verder can retrofit to and refurbish existing systems in situations where framework suppliers may only want to offer new systems.

One of several recent examples involved re-using two existing storage tanks and a kiosk. Verder organised testing and inspection of the existing capital equipment whereas the framework supplier offer required fitting new tanks and kiosk.

Verder project team

Verder supplies complete chemical dosing systems, pumps and service solutions such as design, build and installation – focussed closely on meeting client requirements.

The chemical dosing solutions are managed and installed by the Verder Project Team, including a project manager, mechanical and electrical engineers and support staff who have provided much needed services to nearly every major water authority in the UK.

Verder engineers have all the current mechanical and electrical qualifications that are relevant, including the health and safety cards required by every water authority, and overseen by trained site safety supervisors.

Verder operates an 'open door' policy to customers, from the initial contract bid, through to the first phone call for spares or contract maintenance. Verder is there every step of the way, acting as a one-stop shop but without taking the

customer for granted, and rewarding them with highly competitive rates and priority service.

Customer feedback regularly shows that the quality and robust nature of the end product and how the project team conducted itself on-site and in consultation are viewed as key benefits.

The Verder service centre

Before the system is installed on-site, all these components are first tested at Verder's Service Centre. This offers the client full factory acceptance testing and simulation prior to delivery.

Design philosophy

Verder conducts site surveys, puts together the method and risk assessments, performs all the mechanical and electrical calculations and design. The Verder project team also offers modelling of all units in 3D computer aided design (CAD) software showing pipework, cabinets and pumps in greater detail.

Verder works with site operators and engineers in to discuss their requirements, whether the setting is in a boardroom or on-site in boiler suits, presenting a professional attitude combined with courtesy and respect.

Ultimately, Verder aims to save water utilities as much money as possible while providing them with more reliable and robust equipment. The key is avoiding hidden costs having to be added at the end of a project, whilst keeping the customer in the communication loop from start to finish.

In focus: Dosing at Thames Water Crawley STW

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 due to a high 8 metre suction lift requirement 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.



The Verder UK Service Centre

The Verder UK Ltd Service Centre is a state-of-the-art facility located at the head office in West Yorkshire with the latest test facilities and instrumentation. Our Service Centre team is staffed by highly qualified and experienced engineers. All work is completed to ISO 9001:2000 accreditation.



In focus: Ashford Common WTW

Verder supplied Thames Water with chemical storage facilities for chemical dosing.

Verder UK installed a full turnkey chemical delivery, storage and supply system consisting of

- Duty/standby tanks
- Control system
- Carbon steel rubber lined fill pipes
- Concrete surround with a full GRP gantry.

The control kiosk contains a control panel system and fill point.

The right-hand cabinet (pictured left) has two filling points with a sample run-off container below and full level indication panel.

The kiosk also features a wash-hose and spillage kit for any accidents for wash-down procedures. The entire kiosk was created to the Thames Water specification in conjunction with GBM. All pipework was installed and hydrostatically tested by the Verder UK project team.

The systems was designed, assembled, installed and commissioned by the Verder UK project team.



In focus: Shalford Thames Water STW

Shalford STW serves the local Guildford area.

Following the requirement to fully refurbish the site, Verder UK were chosen as the Project Team who could provide an external temporary dosing system, which meant the waterworks could stay 100% operational whilst the dosing plant itself could be renovated.



Verder supplied a full temporary dosing solution to allow the chemical room to be renovated with 6 dosing cabinet systems for polyelectrolyte, sodium hydroxide and ferric dosing, a poly make-up tank, control panels and pipework. The entire plant room was repainted, including the floor.

Shalford STW pre-installation



At Shalford STW, the existing system was leaking, outdated and proving a significant problem for the Thames Water team on site.

As an additional requirement, the site required a temporary dosing solution whilst the old facility was removed and the new was installed.

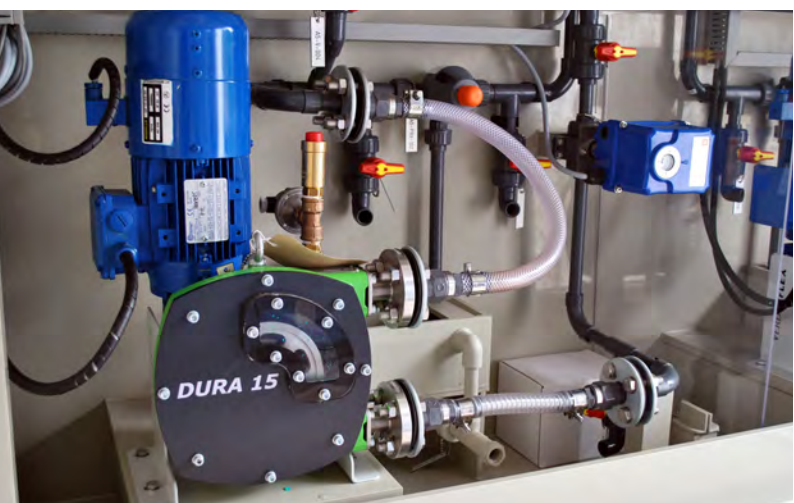


Verder Chemical Dosing Package plant systems

Package plant systems allows for the full preassemble and testing of the complete dosing solution, minimising site work.

Verder chemical dosing package plants

- GRP kiosk with bund area
- Dosing rig
- Chemical storage tanks
- GRP walkways and access
- Tanker fill points
- Booster set, wash down and emergency shower facilities
- Control system



Verder package plant systems are assembled and tested at the Verder Service Centre before being shipped to site for installation, further testing and commissioning.



In focus: Dosing and circulation of lime at Severn Trent Barston STW



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 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.



The pump was in fact such a success that the Verder UK team won the bid to provide a chemical dosing skid for sewage treatment.

This system incorporated a cabinet with Verderflex Dura peristaltic pumps (1 duty standby). The system is piped to a tank and controlled by a pH meter and inverter to raise/lower the delivery of the dosage depending on the demand or volume of sewage. An emergency shower was also installed.



The Verder UK team provided consultation to the Severn Trent Team, a full drawing service, assembly and testing at the Verder Service Centre, on-site installation and commissioning, contract maintenance and spares requirements.

Further site references

Harlow Hill

A series of Verderflex peristaltic pumps were installed for the use lime dosing to regulate the pH levels following the removal of phosphates.

The installation was controlled through a pH monitor determining the speed of the pumps via an inverter to maintain a stable pH.

The Verderflex pumps were chosen due to their ability to handle abrasive lime slurry as well as our experience on similar sites. The Verder UK team provided pipework, controls, pumps, design, installation and commissioning.



Roundhill

The Roundhill site contains multiple skid units capable of pumping both liquid and crystal chemical. The Verder UK Team provided the design, build and installation of the skid units, the kiosk housing and pipework (including ground pipes). The system was praised for its high standard of finish, particularly with the secreted pipework runs underneath the units.

The control unit was also supplied; built specifically to the requirements of the customer.



Rymeads

The Rymeads site contained several skids capable of dosing copperas chemical in either liquid or crystal format. To accommodate this an easy-drop unloading port was constructed for tanker or truck unloading.

All the dosing skids were assembled using Verderflex peristaltic pumps in our Service Centre. The Verder UK Team provided the skids, kiosk, pipework and controls.

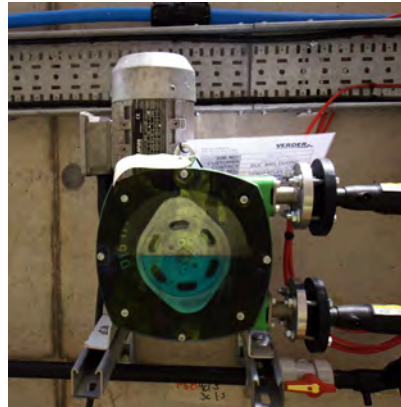


In focus: Dosing in Anaerobic Digestion

The production of energy from waste is one of the important process requirements in the renewables sector.

The Verder UK Team have provided pumping solutions not only to the handling of waste food slurries, they have also provided the dosing solution to create the optimal conditions for the anaerobic digestion process.

The Verderflex Dura pump doses enzyme to regulate the slurry mixture. The dosed slurry is then circulated through a bank of Verderflex VF Industrial pumps distributing the solution and recirculating like a cow's stomach.





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