

# The Watermark

The Newsletter From

**Automated Water & Effluent Ltd**

Autumn 2017

## Mixers High Speed & Geared

Leading on from our recent Summer issue of The Watermark celebrating our 35th year in business - for over 30 of those years we have supplied a range of mixers which are mainly of our own design and manufacture.

Many of our customers use our instruments to measure pH and control dosing pumps, which meter chemical reagents into treatment tanks. These chemical treatment tanks need to be mixed to ensure that the dosed reagent corrects the pH to the desired value.

In addition to mixing the treatment tanks - the reagents themselves are very often mixed with water to make up the correct solution strength for dosing.

Polymers and coagulants used to assist settlement of heavy metals are diluted and mixed before being dosed. Hence industrial mixers are an important of the process of waste water treatment.

We are able to supply slow-speed industrial mixers suitable for polymer mixing, as well as mixing & dosing tanks. We offer both high speed mixers, geared mixers, and some from each of the ranges are available as pneumatic mixers.

Both of our mixer types includes

models which are suitable for installation on top of dosing tanks. The TM range of Tank Mounting mixers are high speed direct drive mixers with marine type propellers for use in vessels which are always full of liquid. There are 5 models in the range TM0 to TM4 with motor sizes from 0.25kW to 1.5kW with 316 Stainless Steel shafts and 3 propellers.

Our high speed mixer range run at an output speed in-line with the motor, including our model TM0 which is fitted with a 75mm diameter propeller and TM1 which is fitted with a 100mm diameter propeller.

Both mixers have 4 pole motors which run at 1440 RPM offering simple and cost effective mixing, ideal for chemical reagent make up of non viscous solutions with an SG 1.0.

Our TM2, TM3, and TM4, are heavy duty mixers designed for mixing larger volumes of solution continuously. They are fitted with 6 pole motors so run on UK 50Hz mains supply at 960 RPM and are fitted with larger marine type propellers. Note the high speed mixers must only be run with a full tank of liquid. We can provide liquid level

controls to stop the mixer from running unless the vessel is full.

The GMW range are geared mixers with larger diameter flat bladed impellers for use in vessels with more viscous liquids like polyelectrolyte or vessels with varying liquid levels.

Sizes range from GMW0 to GMW41 with motors sized from 0.18kW to 3.0kW each fitted with 316 stainless steel shafts and flat bladed impellers.

These mixers have a gearbox to reduce the speed of the impeller which is a larger diameter with flat blades to provide a larger surface area in contact with the fluid being mixed.

This provides a more gentle mixing action with the GMW0 and the GMW1 being ideal for mixing small volumes of polyelectrolyte without damaging the delicate flocculent which are forming during the mixing process.

Each of the industrial mixers in the GMW range can be supplied with single or dual impellers and with speeds of 70, 140 or 280 RPM subject to motor size.

Any of our stainless steel mixers can be supplied with plastic coated shaft and impeller(s) to provide increased chemical resistance.



# Technical Tips

## Peristaltic Pumps

Our customers keep on finding tricky dosing applications for us to try and find a solution too. When the problem requires a cost effective solution our peristaltic pump range seems to be the answer.

Some of the applications we've been looking into recently seem to have the following requirements:-

The application requires intermittent or non-continuous dosing.

A long suction lift is required.

The chemical reagent is viscous.

The chemical reagent has a high specific gravity and a suction lift is required from a drum or storage tank.

Our BWP120 is a big wheel peristaltic with a maximum output of 120 L / Hr which is also user adjustable. Inside the pump and on the PCB is a link or jumper which selects one of the four motor speeds, which provides outputs of 30, 60, 90 or 120 L/Hr.

As with most small peristaltic pumps they do not have a continuously rated motors and due to the operation of the pump the tubes require regular



replacement if the pump is run continuously at high outputs. However there are many applications where this is not a problem such as when the pump is only subject to intermittent usage. In these instances peristaltic pumps really are an excellent pump. A selection of tube types are available,

so a wide range of chemical reagents can be pumped. These include:- EPDM, Viton, Silicon, and Santoprene.

Our recommendation is that the pump is always installed on a suction lift application and not a flooded suction. In a flooded suction type installation the failure of a pump tube could lead to the contents of the reagent storage tank leaking from the damaged tube.

The advantage is on a serviceable pump the action of the roller pressing upon the pump tube acts as a non-return or anti-syphon valve which is a significant advantage.

Part of a good preventative maintenance routine is to replace the pump tube after so many hours of running prevent them from becoming worn while under operational conditions.

The BWP120 peristaltic pumps can be supplied in our polypropylene housing with clear PVC front panels and with double confined dosing tubes for additional protection.

## Portable Flow Proportional Chemical Dosing Rig Dosing

From time to time customers request us to help them by building special items for them to solve their problems.

Accurately dosing into a water flow is an application that we come across frequently. There are numerous reasons why dosing into a water flow is required - it could be for pH adjustment, adding a nutrient to water for irrigation, or any other flow proportional chemical reagent dosing application.

The dosing rig shown in the picture has a magnetic flow meter which accurately measures the flow passing through the manifold.

When installing a magnetic flow meter, a length of pipework equal to the multiple of the magnetic flow meter diameter must be situated both before and after the mag flow meter. This ensures that the reading is both stable and accurate. The manifold pictured accounts for this inside the enclosure.

The output from the mag flow meter is used to control the speed of the

electronic dosing pump. This ensures the dosing pump delivers a constant dose of chemical reagent proportional to the flow rate through the manifold.

The output of a small dosing pump will



v a r y depending upon the pressure that is being dosed against. To ensure that a constant volume of chemical reagent is dosed, a

loading valve has been fitted on the output of the dosing pump. This gives the pump a constant back pressure to work against and delivers a consistent dose proportional to the carrier water flow.

The system shown could have the magnetic flow meter calibrated for a maximum flow rate of 10m<sup>3</sup> per hour and the dosing pump has an output of 10 litres per hour against 10 bar pressure. In this instance the maximum dosing rate would be 0.1% Vol / Vol or 100 ppm (mg / Litre).

If the mag flow meter was calibrated for a V<sub>max</sub> of 20m<sup>3</sup>, the maximum dosing rate would be 0.05% Vol / Vol or 50ppm (mg/Litre).

We are able to supply dosing pumps with different outputs to suit different dosing rates. For larger dose rates or higher pressures we are able to build systems with motorised or mechanical dosing pumps with inverter controls, which are normally supplied as static systems.

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