

## Improve the quality and efficiency of your dosing with a pulsation- free and maintenance friendly dosing solution

Dosing liquids is gaining importance with the modern chemical processes these days. Chemical companies are achieving increased successes with producing special chemicals and special polymers. For producing these products, dosing additives are often very essential. Additives are adding specific characteristics and/or are necessary for an efficient reaction.

In the past the quality of dosing was less important, but nowadays the quality of the process and the efficiency is highly dependent of it. Goals like minimizing the quantity of used additives, increasing the control of the reaction, or increasing the homogeneity of the mix during the whole process, can only be achieved with a pulsation-free and highly accurate dosing of additives. Processes are very sensitive to the quantity and the continuity of the dosing. Especially with the new trend of continuous flow reactions.

### Traditional dosing pumps

Traditional so-called dosing pumps used for dosing liquids, like membrane or piston pumps, are ideal for metering the flow easily, especially with batch processes. However, they have the disadvantage of creating a pulsated flow. These pulsations are disastrous with continuous flow reactions, but it is also less desired with batch processes, because with batch reactions additives have to be dosed with a continuous flow, making it possible to control the reaction. Those pulsations may be decreased by using a pulsations damper, but these dampers are only efficient with a limited pulsation frequency and do not eliminate the pulsations completely. Also, adding a damper will create an extra mechanical appendage, which will increase the need for maintenance of the used equipment.

### Membrane and piston pumps

Membrane and piston pumps, also known as dosing pumps, have the additional disadvantage of the incorporated valves. These valves are maintenance demanding, but also a reason of failing dosing and failing processes. Besides, these valves are limiting the flexibility of the pressures. Especially in case these vary from vacuum to high pressures. For instance, vacuum circumstances may open the valves at the wrong moment, which results in uncontrolled capacity.

### Gear pumps

For all these reasons, gear pumps are a better choice for dosing applications. Especially the ones with high volumetric efficiencies due to their low tolerance and/or high speed. Even for low viscous products like solvents, alcohols, or liquid gases, gear pumps can be used for exact and pulsation-free dosing. Pulsation-free dosing with low capacities (from 30 ml/h or a few ml/min) can be done easily with micro gear pumps. Higher capacities can be obtained with highly accurate gear pumps.

## suurDOS systems

High accuracy, with a tolerance of  $< 0.3\%$ , can be achieved with a flow controlled solution. For example with the often used suurDOS® systems, which are based on gear pumps. Manufacturers of gear pumps who have designed their pumps especially for the chemical industry, like MAAG Gear Pumps, Gather or HNP-M, offer modular pumps, making it possible to select for each and every application the right materials for the pump housing and internals. With these modular systems the materials of the pump are not only adapted to the chemical characteristics of the dosed products, but also to the typical operating data such as viscosity, operating temperature and pressure.

In this way the pumps are designed for their purpose, resulting in a maintenance friendly and reliable dosing solution, therefore in a reliable accurate process!

Gear pump based dosing systems can be found in laboratories, pilot plants, liquid dosing processes for extrusion and compounding, continuous (micro) flow reaction systems and all other chemical processes where a reliable, pulsation-free and highly accurate dosing solution is absolutely indispensable.

