

Life Science – Liquid mixing systems

Application note A027C-LS05M04-0213A



In the past contact lenses manufacturers were required to manually prepare batches of 17,000 litres of PVP (Polyvinylpyrrolidone) diluted into a saline solution which had to be refrigerated to maintain a shelf life of just 20 hours due to bacterial generation. As a result the manufacturing process had to be halted whilst freshly prepared batches were reinstalled.

Thanks to Bronkhorst High-Tech continuous proportional dosing systems we have considerably increased the production output and reduced manufacturing costs.

- ◆ PVP Dosing Machine
- ◆ Tabletisation
- ◆ Fragrances



Compact continuous dosing system

Application requirements

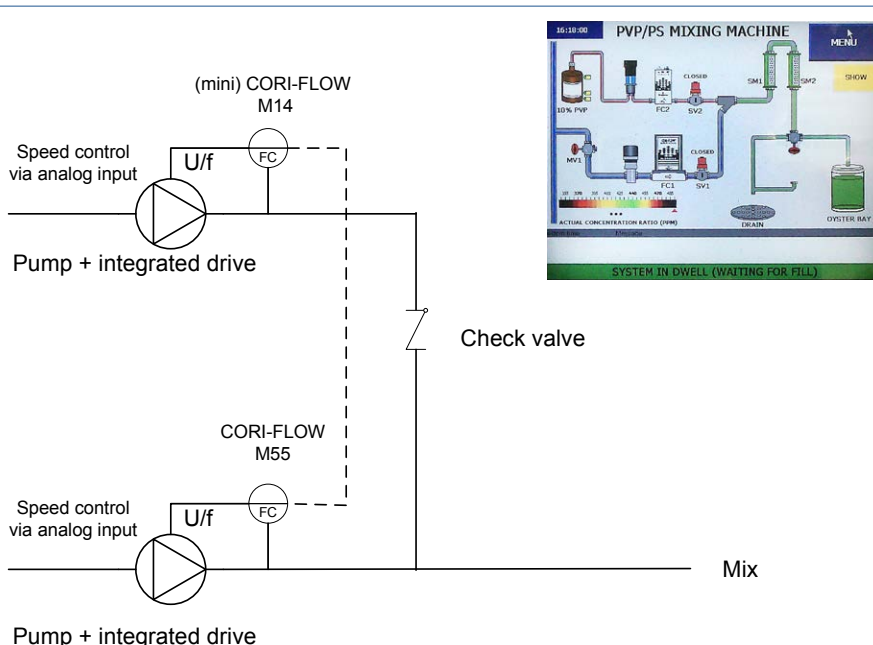
Contact lenses are complex biomaterials that must provide a range of physical properties in order to be effective, safe and comfortable to wear. These properties include: (1) high oxygen permeability in order to transmit Oxygen to

the cornea, (2) hydrophilic surface so that a continuous tear film coats the lens providing lubrication and (3) resistance to bacterial and protein absorption.

Important topics

- ◆ High accuracy
- ◆ Filters to protect gear pumps
- ◆ Compact build in system
- ◆ Stable control

Process solution



A schematic technical diagram showing our product included in the customer's process

The Coriolis Mass Flow Controllers primary function is the proportional dosing of PVP into a Saline solution using a Master / Slave principle. As a result of a variable main flow, the slave-instrument responds to the changed master output signal. By communicating directly via DeviceNet™ with the supervisory automation and control system the Master CORI-FLOW™ instrument is provided with the precise dosing requirements.

The compact design of the Bronkhorst Cori-Tech instruments, where the Coriolis meter and controlling Micro-annular pump are mounted in one compact unit, was a key factor in selecting the Bronkhorst solution.

The advantages of this continuous dosing process is the reduced floor space needed due to carboy 17,000 litre vessels both full of product and one end of the production process and empty at the other no longer being required. Further advantages were found in reduced PVP wastage due to the highly accurate Coriolis measurement principle. ▶

Many applications ask for compact, accurate measurement and control of additives to be proportionally dosed into a main flow. By using mini CORI-FLOW™ instruments it is easy to set up compact autonomous working systems that offer this functionality without the need of external computer hardware and software.

Of further interest were the extensive tests carried out to study the length of time that bacterial growth occurred within the Coriolis instruments and gear pumps.

The customer required no bacteria growth between planned maintenance periods of 13 weeks. After 26 weeks of testing without bacterial generation the customer concluded no further testing was necessary. ■



mini CORI-FLOW™ M14 and CORI-FLOW™ M55

Recommended Products



mini CORI-FLOW™ series (slave)

Compact Coriolis flowmeter for ranges of 30 g/h...30 kg/h and additional density and temperature output; analog signals and RS232 are standard; fieldbus communication is optional (e.g. Profibus-DP, Modbus, DeviceNet, Flow-Bus).

- ◆ Accuracy: 0.2% reading +/- zero stability
- ◆ SS316L or Hast C22 all metal wetted parts
- ◆ No moving parts
- ◆ Fast response (up to 50 msec)
- ◆ Mass flow, density and temperature measurement
- ◆ Optional field bus interface
- ◆ Easily re-rangeable
- ◆ Cori-Fill dosing firmware



CORI-FLOW™ series (master)

Coriolis flowmeter for ranges of 500 g/h...600 kg/h and additional density and temperature output; using integrated batch counter and directly controlling shut-off valve for dosage; analog signals and RS232 are standard; fieldbus communication is optional (e.g. Profibus-DP, Modbus, DeviceNet, Flow-Bus)

- ◆ Accuracy: 0.2% reading +/- zero stability
- ◆ SS316L or Hast C22 all metal wetted parts
- ◆ No moving parts
- ◆ Fast response (up to 50 msec)
- ◆ Mass flow, density* and temperature measurement
- ◆ Optional field bus interface
- ◆ Easily re-rangeable
- ◆ Optional remoted electronics
- *) if applicable for model



HNP Mikrosysteme MZR-4605 Micro-annular pump

These ultra low-flow, miniature, positive displacement pumps are designed for precise, accurate, smooth, pulse-free pumping and dispensing of a wide variety of liquids. The compact size and low mass of the MZR pump/motor units ensure they can easily be incorporated into the designs of many systems.

- ◆ Accurate dispensing of volumes as small as 0.25 microlitres
- ◆ Low flow dosage in the micro litre range
- ◆ Pulseless delivery



Filters

Inherent to their construction gear pumps are sensitive to particulates damaging the internal gears. To increase MTBF (Mean Time Between Failures) it is important to ensure that the fluid is free particulates.

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Process industry
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LS: Life Science
 05: Pharmaceutical
 M04: Mixing liquid

