

A Dosing System for Clearer Vision

Bronkhorst UK Ltd

Bronkhorst UK has been working with a manufacturer of contact lenses to improve the dosing of cleaning solution within their manufacturing process. The customer, a leading supplier of daily contact lenses to the global market, needed to significantly increase their productivity whilst simultaneously tightening process parameters and increasing quality. A partnership between the engineering teams developed a tween-solution dosing system that ensures both complete mixing and a highly accurate and repeatable dosing rate even with a variable main water flow. This ensures that a uniform and strictly controlled concentration of the cleaning agent is applied to the process machinery after each production run. This, in turn, ensures the integrity of every production run, surpassing each quality inspection and, most importantly of all, fulfilling the demanding needs of the ultimate consumer. Consumer image is therefore maintained whilst reducing downtime, scrappage and waste.



Having identified various options, the team determined that the best solution for global implementation was the design of a compact system ideally configured to simply retrofit onto the existing production machine. Dimensions needed to be exact, all wetted parts needed to be 316 stainless steel and the liquid process connections needed to be Tri-Clamp®. Further discussions culminated in the decision to utilise Coriolis Technology further enhanced by Master/Slave ratio control. The main, variable, water flow is measured by the Master Coriolis Meter and an output

signal sent to the Slave. The slave consists of a Coriolis Flow Controller with the control device being a close-coupled pump. Using the in-built PID function of the instruments and the Bronkhorst FLOWBUS communications protocol resulted in a small network within which the instruments worked in unison. A single dosage rate command meant that the operator could very simply, and in real-time, adjust the dosing ratio as set by the process requirements for that day or even for that 'run'. With a flow rate of 1000 kilograms/hour for the main water feed and 1 kilogram/hour for the concentrated cleaning agent the flow-rates proved to be ideal for the low flow experience and expertise of Bronkhorst. All the necessary parts were supplied and fitted, including valves, filters, connectors, a static mixer and the stainless steel housing. In doing so the cabinet was virtually 'plug and play' thereby minimising time and cost for installation.

Bronkhorst has developed the technology and knowhow to be able to offer chemical dosing systems with its Coriolis Flowmeter range using its CORI-FILL firmware. This is further extended by utilising Master/Slave Dosing and mixing. Bronkhorst is able to offer accuracy of +/-0.2% Reading with the instruments being certified to ATEX Zones 1 and 2. On-board PID control is standard as is over-run protection and a self-learning function. The turn-down ratio is 2000:1, with flow rates down to 0.1 grams and lower depending on application. The physical size ("the smallest Coriolis instrument in the world") has proven to be perfect for multiple injection points within a confined space. The Coriolis system can be integrated with virtually any pump technology, control valves or indeed shut-off valves should the application demand it.

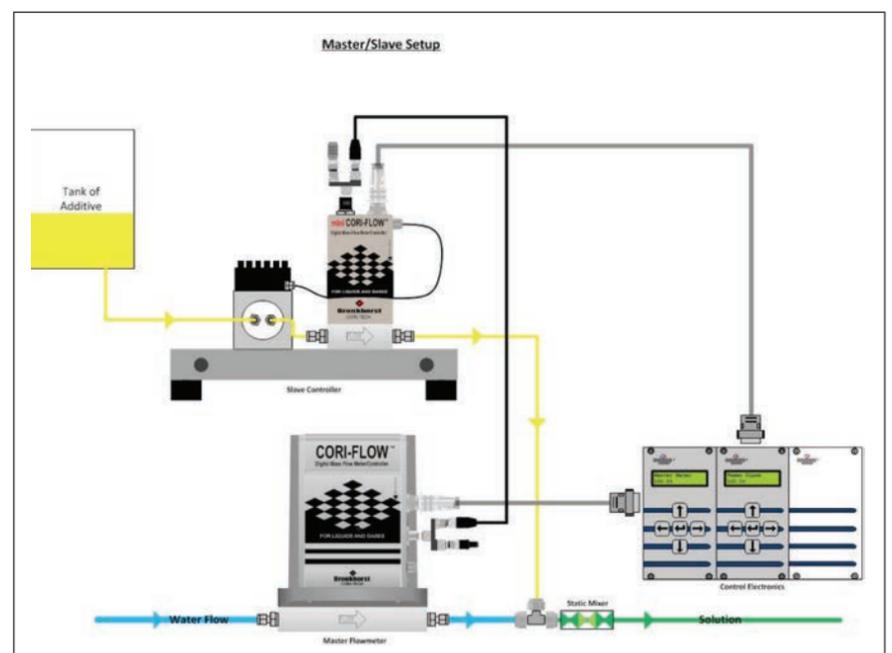
<https://www.youtube.com/watch?v=pAgjHZVMNNE>

CORI-FILL is suitable for a whole range of batching, blending, dosing, filling a sterilisation applications. The market place this is aimed at is vast and as we have found over the years it is being used from very low dose amounts to high volumes.

With the conventional methods of using a mass/volume flow meters, separate shut off valves and batch controllers or gravimetric processes using weighing scales where fluids are dosed one by one this can be time consuming, sometimes inaccurate and costly as there also is some need for engineering experience to tune the system correctly.

<https://www.youtube.com/watch?v=pt1lqq9rOag>

Using the Bronkhorst CORI-FILL system which is very much a plug & play type system this can make life for the end user so much simpler. Using one of our Coriolis instruments with a close coupled pump or valve the CORI-FILL system is neat and compact so requires little installation space. What this means is that the pipe lengths from raw ingredients to the process can be kept short to ensure the optimum condition of fluids. The CORI-FILL system can offer to the end user an improved accuracy of dosing and this can also bring shorter production times.



The use of a pump alone certainly has its place across industry as invariably 'they do exactly what it says on the tin'. However, on occasion, there are benefits in coupling a flowmeter to directly control the speed of the pump.

These benefits can be summarised as:

Accuracy – the delivery of the pump will be controlled to exactly the required amount and can be data-logged for accountability purposes.

Increased Yield – with tighter process controls the final product quality can be increased whilst also decreasing waste and re-work.

Reduce downtime – the control signal between the flowmeter and the pump can be monitored, and alarmed, for change of state diagnosis. Often this can be used for preventative maintenance thereby reducing downtime.

Bronkhorst are specialists within the field of low to ultra-low flow liquid delivery, from milligrams per hour through to thousands of kilograms per hour.

For more information please contact us;
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