

Reliable HCl Concentration Control Provided by Micro Motion Zirconium Fork Density Meter

RESULTS

- Provided highly accurate concentration measurements within $\pm 0.1\%$
- Ease of cleaning improved operator safety by reducing the exposure to hazardous materials
- Cost-effective solution in the aggressive acidic environment



APPLICATION

A global leader in developing and manufacturing silicone products derived from quartz and specialty ceramics uses a density meter to control the hydrochloric acid (HCl) concentration produced by the liquid dye hydrolysis process. The HCl is reused as an input for the manufacture of methyl chloride (CH₃Cl) that is in turn used to manufacture the dye products..

CHALLENGE

Hydrochloric acid concentration control, which is typically performed by adding water to a concentrated HCl solution, is the biggest challenge in the dye hydrolysis process. Because HCl concentration is critical for the optimization of the production process, the manufacturer requires a highly accurate concentration measurement.

Additionally, if process upsets occur during the liquid dye hydrolysis process, silicone gel can contaminate the HCl solution — causing product buildup on the density meter. Having a meter that is easy to clean, with the ability to access all wetted parts, is ideal.

Given the highly corrosive behavior of HCl, the manufacturer is limited to using a subset of standard corrosion-resistant materials — with Tantalum considered as being prohibitively expensive.

SOLUTION

The silicone manufacturer had an opportunity to replace an existing density meter in its liquid dye hydrolysis process after the meter had failed. Because the manufacturer had used Micro Motion® products before, they trusted the brand and the products. With the recent introduction of the Micro Motion Insertion Density and Concentration Meter in Zirconium, the manufacturer found a product that met its process needs.

“The Micro Motion fork delivered as we’d hoped – good density measurement for process control and easy accessibility to all wetted parts.”



Installation of a Micro Motion insertion liquid density and concentration meter in Zirconium at the silicone manufacturer



For more information:
www.MicroMotion.com/chemical
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The fork density meter in Zirconium provided the following benefits:

- Highly accurate density measurements within ± 0.001 g/cm³ and concentration measurements within $\pm 0.1\%$.
- Rugged and reliable design, with the availability of PFA-coated tines. PFA has proven to have better non-stick performance than standard sensor finishes.
- Simple meter design and installation, allowing easier access to all wetted parts for draining and cleaning. The ease-of-access for draining and cleaning reduced the potential exposure to hazardous chemicals and increased the safety of the workers.
- More cost-competitive solution, than using other corrosion-resistant materials.

According to the manufacturer: “The Micro Motion fork delivered as we’d hoped – good density measurement for process control and easy accessibility to all wetted parts.”

