

Decreasing Production Costs with Continuously Volumetric Dispensing

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Dispensing is one step of the production process that doesn't get as much attention as the main processes of screen printing and the P&P process. All too often it is believed that any inexpensive dispense method can do the application well enough. For some applications such as solder mask, some coating or glob top, this can be the case. The simplest and most common method of dispensing is *time pressure* which applies a controlled burst of air pressure to a syringe or fluid reservoir that translates to some quantity of fluid. This process can work well but falls apart once basic factors of production come into play. Those basic factors are a level of fluid in the syringe, residue left on the side of the syringe that then increases the friction for the stopper, and fluids that are changing viscosity over time. These mentioned factors increase the pressure or force required to move the stopper, which directly affects the displacement of the stopper and quantity of fluid dispensed.

Implementation of PCD continuously volumetric dispense technology has allowed customers to enhance existing process as well as implement new applications with minimal time and effort.

Many customers often complain of needing to adjust the pressure or time of dispense during the course of a production day. Other common dispense valves that are also based on pressure are Needle Valve, Spool Valve, and Pinch Tubes. All of these valves are essentially opening a gate and allowing fluid that is under pressure to pass. The advantage of these mechanical valves is that the fluid can remain under constant pressure so the level of fluid in a syringe or reservoir does not greatly affect the process, but the other factors of viscosity change and stopper stiction do. Also, when needle valves close there is a surge of fluid that comes from the pin (needle) seating inside the inner seal. This surge makes a snake head at the end of the line. Spool Valves and special design Pinch Tubes have a built in suck back but these are plagued with a delay at the start of the process. It is very difficult to try to accommodate for changes in fluid viscosity, opening rate, and reservoir pressure to get a uniform dispense line.



Advancements in the dispense technology are eliminating issues associated with time/pressure. PCD continuously volumetric dispense technology is an improvement on the fixed chamber volume pumps as inconvenient recharging is not required. Fluids such as die attach adhesives, encapsulants, glues, and UV curables are easily dispensed with PCD continuously volumetric technology resulting in less scrap, reduced product rework, and less material wastage resulting in increased profits.

A fluid manufacturer developed an excellent product with all the right performance characteristics and an attractive price point - the only issue was the fluid could not be reliably dispensed. The fluid supplier tried all known methods of dispensing but always had inconsistent volume over the production day and between syringes. Even with an attractive price point and end properties, not being able to reliably dispense deterred many customers. The fluid supplier subjected our PCD,



continuously volumetric dispense technology to excessive dispense trials that consisted of varying levels of fluid in the syringe, fluctuating pressure at the reservoir, dispense tip left in air, and fluid that was prepackaged and let to sit for more than a week at room temperature before use. The latter was a concern as the fluid was known to increase viscosity without agitation. Our continuously volumetric dispense technology was able to pass all the tests the fluid supplier asked and exceeded their expectations; not to mention the dispense rate was higher than what was initially asked for. Due to this investigation of our PCD, continuously volumetric dispense technology the fluid supplier was able to confidently promote their innovative fluid and offer a dispense technology that minimized waste, reduced cycle time, and yielded excellent repeatability over the course of a production run. For the customer, implementing PCD continuously volumetric dispense technology allowed them to utilize an innovative fluid resulting in an enhanced product and cost savings. Operators were not required to continuously check the system and make time-consuming black magic adjustments, fluid use was optimized, rework was all but eliminated, and throughput increased, allowing the company time to work on streamlining other processes, resulting in further cost savings.

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