

WaterWorld

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New Valveless Solution for Metering Concentrated Hypochlorite

Bethpage Water District in Long Island overcame the priming and out-gassing issues associated with metering concentrated hypochlorite. Installing a Chloritrol® metering system also helped the drinking water utility reduce both space and energy consumption when compared with traditional hypo injection technologies.

Mike Boufis was the newly appointed Superintendent of the Bethpage Water District (BWD), a community water district located in suburban Long Island, when he found himself in the middle of an ongoing conflict with the local county health department regarding the mandatory chlorination of drinking water.

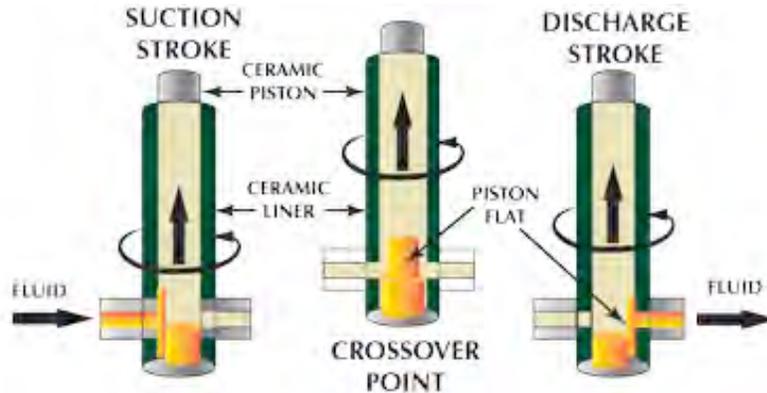
The metering system's fluidics are contained within a space-saving protective enclosure suitable for wall mounting.

For over 85 years, proactive measures enabled Bethpage Water District to deliver excellent quality water, which met and continued to meet the health department's increasing testing requirements without violation. In fact, Bethpage Water was the recipient of "Best Tasting Drinking Water Award" for 2008.

After a hard-fought battle against chlorination, a state court ruled in support of a mandate that required BWD to begin disinfecting its water by June, 1 2010. Boufis moved forward with plans to incorporate chlorination systems at each of Bethpage's several water plants.

Boufis was new to Bethpage Water but hardly new to water operations. His previous experience included 20+ years in operations at one of the largest groundwater suppliers in the country, overseeing 500 active wells. He had many years of hands-on experience

with both calcium tablet and liquid sodium hypochlorite systems. He decided that wherever possible, he would use concentrated sodium hypo. His decision was reinforced by his past experience with the newly patented Chloritrol® metering system, which he had installed at several locations at another water authority. The system allowed Boufis to meter concentrated sodium hypo without dilution, and not be concerned about the effects of out-gassing or loss of prime.



While concentrated hypo is an accurate disinfectant, the high concentration of chlorine results in a fluid that has a strong tendency to outgas, especially on the inlet side of a pump. This property creates problems during priming, as well as creating a loss of prime condition referred to as “gas-lock”. To deal with this problem, some water plants choose to dilute the sodium hypo to a lower concentration which reduces out-gassing but adds additional handling which most would like to avoid.

Both diaphragm and conventional piston pumps rely on check valves to maintain efficient fluid flow and prime. For the most part, check valves operate passively based on fluid dynamics created by the pump mechanism. When any air, or gas, is introduced into the system, the efficiency of the check valves is reduced considerably. Add the condition of pumping against system pressures of 75-125 psi, and check valves can become air-locked resulting in a loss of prime.

Many pumps that are specifically designed to meter concentrated hypo (12.5% and above) incorporate a method to deal with the outgassing phenomenon. These designs can be elaborate and add even more valving to periodically “bleed off” accumulated gas on the inlet side of the pump.

The Chloritrol system uses a valveless piston design and eliminates the need for check valves and the associated maintenance. It uses a sapphire-hard ceramic piston which will not fatigue or deform over time. The piston and the mated ceramic liner are dimensionally stable resulting in long-term, drift-free accuracy for millions of cycles. The system’s patented “CeramPump®” was invented by Fluid Metering over 50 years ago. It is fundamentally a piston pump design, but unlike conventional piston pumps, there is only one moving part in contact with the fluid, the ceramic piston. Similar to most piston pumps, the reciprocation of the piston accomplishes the pumping function. However, this is where the similarity ends. Simultaneous rotation of the piston alternately aligns a flat on the end of the piston with the inlet and outlet ports of the pump, functioning as a “virtual” valve. While concentrated hypo is an accurate disinfectant, the high concentration of chlorine results in a fluid that has a strong tendency to outgas, especially on the inlet side of a pump. This property creates

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