



## ***Application Note to the Field***

## **Sodium Hypochlorite (Bleach)**

**Application Note Number: 1601-3**

**Date: January 21, 2016**

Sodium Hypochlorite (NaOCl or NaClO), most commonly referred to as bleach, is a prevalent chemical in the water treatment and papermaking industries. It is widely known for its disinfectant and its whitening properties. In industrial applications, it is most often handled at ambient temperature in 12% concentration, with a 2.6 cP viscosity.

While there are several plastics and elastomers that are compatible with hypochlorite, metals can be a bit more tricky. 316 stainless steel is not compatible at any concentration. Alloy-C can be used at lower concentrations (0-20%) and ambient temperatures, but corrosion can still occur. Titanium is the best metal to select for hypochlorite applications, but its cost and availability can be an issue.

Even though the above materials are available, for Liquiflo, our go-to choice for handling Sodium Hypochlorite, and any hypochlorite in general, is the Poly-Guard<sup>®</sup>, PFA-Lined pump, with a titanium 4-Series pump being the second choice. The Poly-Guard can handle flow rates up to 15 GPM, whereas the 4-Series is limited to a little over 3 GPM. Both the Poly-Guard and 4-Series pumps are available in standard mag-drive configuration.

The Poly-Guard has a few distinct advantages over other similar non-metallic gear pumps. First, the inside of the pump is lined with PFA, a chemically resistant material that is not subject to the high corrosion rates of metal. Also, unlike similar non-metallic gear pumps, the Liquiflo lining contains no carbon fillers. Carbon is not compatible with hypochlorite, and the presence of these fillers in competitors' designs can cause leakage through the housings of the pump. Finally, the outside of the pump is made of stainless steel, which provides a safe and strong structure in rough, dirty, dangerous and/or corrosive environments.

The preferred materials of construction for a Liquiflo Poly-Guard pump in hypochlorite service are: PFA, Kynar, Silicon Carbide (SiC) and Viton. For the 4-Series pumps, titanium, SiC and Teflon are the best available materials (since PEEK, Ryton and carbon are not compatible with hypochlorite). Therefore, typical model codes would be:

<b>Pump Model Code</b>	<b>Description</b>
P4LKKBB000BVU	Poly-Guard PFA-Lined Stainless Steel mag-drive gear pump; Model P4 (5.0 GPM max) with ANSI flanged ports; double Kynar gears, SiC wear plates, bearings and shafts; NEMA 56C motor frame; Viton O-rings; MCU magnetic coupling
45T433BN200	4-Series Titanium mag-drive gear pump; Model 45 (3.4 GPM max) with NPT ports; Titanium drive gear, Teflon idler gear and wear plates, SiC bearings; MCN magnetic coupling; NEMA 56C motor frame; Titanium oxide (TO) coated shafts; virgin Teflon O-rings