

# Chemical Storage

## Storage of Sodium Hypochlorite (NaOCl) in Polyethylene Tanks

Some concerns have been expressed to Saint-Gobain Performance Plastics regarding the storage of sodium hypochlorite in polyethylene tanks.

Although polyethylene storage tanks have been used for storage of sodium hypochlorite in the field for many years, there have been premature failures in very specific locales. We have reviewed all data available on the chemistry and technology of sodium hypochlorite storage, and we have the following information:

Sodium hypochlorite (NaOCl) has no direct effect on polyethylene. This has been confirmed by the resin suppliers. It is suspected however, that contaminated sodium hypochlorite does cause accelerated deterioration of polyethylene

tanks when stored over a period of time. Contamination such as trace metals, e.g. iron, copper, etc., which may be generated from pumps, plumbing, fittings, etc., or a poor quality (trace contamination) sodium hypochlorite shipment, may cause brittleness and cracking of the polyethylene tanks.

We feel the main contributor to premature failure of polyethylene storage tanks is contamination; the presence of sunlight catalyzes/accelerates the rate of attack on polyethylene. **Saint-Gobain Performance Plastics will only warrant tanks for the storage of sodium hypochlorite if the following specifications are met:**

- Heavy-walled tanks (bulk tanks, 1.9 specific gravity)
- Cross-linked polyethylene (XLPE)

We recommend the following steps to be taken by the end user:

- Flush/clean tanks periodically to remove contaminants and deposits
- Check quality of received NaOCl (chemical analysis/purity)
- Check plumbing, pumps and delivery methods for materials of construction

We wish to emphasize that non-contaminated sodium hypochlorite storage in polyethylene is an acceptable and compatible combination. It appears that cracking and premature tank failures occur only when sodium hypochlorite is contaminated with trace amounts of metals and subjected to sunlight.

## A Guide To Using Saint-Gobain Performance Plastics Tanks With Most Common Chemicals

The resins used in Saint-Gobain Performance Plastics tanks are highly resistant to many chemicals. This chart will assist in the selection of tank material for use with common chemicals. Mechanical stress, high temperatures, and extended use tend to multiply the effects of chemicals on the tank.

Such effects should be taken into account when using Saint-Gobain Performance Plastics tanks for long-term chemical storage or with handling equipment. Under normal conditions, chemicals rated "S" may be safely handled by the plastic material. Chemicals rated "U" are not recommended for storage in that particular material.

**This chart applies to tank materials at temperatures from 70°F/21°C to 140°F/60°C.**

**Storage of flammables in plastic tanks must conform to local fire codes.**

Mixing and/or dilution of certain chemicals in Saint-Gobain Performance Plastics tanks can be potentially dangerous. The reactive combination of different chemicals or compounds of two or more classes may cause an undesirable chemical effect or result in an increased temperature which can affect chemical resistance. Small amounts of certain chemicals can drastically change the characteristics of the blend. As temperature increases, resistance to attack decreases.

Chemicals can affect the strength, flexibility, surface appearance, color, dimensions or weight of plastics. The basic modes of interaction which cause these changes are: (1) chemical attack on the polymer chain, with resultant reduction in properties, including **oxidation** and **depolymerization**; (2) physical change, including absorption of solvents, resulting in softening and swelling of the

plastic; **permeation** of solvent through the plastic; **dissolution** in a solvent; and stress-cracking from the interaction of a **stress-cracking** agent with molded-in or external stresses.

**NOTE:** The chemical resistance information in this chart is a general guide only. Because many factors can affect chemical resistance, you should test under your own conditions. If any doubt exists about specific applications of Saint-Gobain tanks, please contact Saint-Gobain Performance Plastics, I-295 at Harmony Road, Mickleton, NJ 08056 or call (800) 543-8823, fax (856) 423-8182.

**ATTENTION:** Please be aware that, although several plastics may have excellent resistance to various flammable or combustible chemicals or solvents, safety regulations for storage or other local regulations may restrict storage of these chemicals in tanks.