

WARNING - SODIUM HYPOCHLORITE CAN RELEASE CHLORINE GAS

Never Mix Sodium Hypochlorite with Acids or Acidic Chemicals

People have been seriously injured as a result of the chlorine released when sodium hypochlorite solutions are accidentally mixed with acids or acidic materials. As more plants use sodium hypochlorite solutions for disinfection, sites must address this potential hazard. Steps must be taken to prevent this from happening at your plant. Accidents have occurred when a tank truck of acid or an acidic chemical was unloaded into the sodium hypochlorite solution (bleach) storage tank, or, conversely, a trailer of sodium hypochlorite solution was unloaded into a tank containing acidic chemicals. All safety sessions should stress the dangers of accidentally mixing sodium hypochlorite solutions with other chemicals

Some of the more common acidic chemicals found at water and wastewater plants include ferric chloride, ferric sulfate, ferrous sulfate, ferrous chloride (pickle liquor), alum (aluminum sulfate), aluminum chloride, hydrochloric acid, sulfuric acid, phosphoric acid or even fluosilicic acid (hydrofluosilicic acid). Under the right circumstances, all of these chemicals can react with sodium hypochlorite and release chlorine gas. There may be other chemicals on-site not mentioned here that also are acidic. Review the MSDS for these materials and if in doubt, contact the supplier directly. Depending on the concentration of the sodium hypochlorite solution, over one pound of chlorine could be released for each gallon of bleach that reacts. A tank truck delivering 5000 gallons of bleach into the wrong tank can release over 2.5 tons of chlorine. Even a few hundred gallons of bleach can release a large amount of chlorine gas.

What steps can you take to prevent this? Some suggestions you should consider are:

- **Extensive Operator Training** - Only specified operators highly trained in the unloading process should be assigned the duty of accepting tank truck, or tank car deliveries.
- **Secured Devices on Tank Loading Lines** - Blind Flange or caps equipped with a padlock or a chain and padlock to prevent a trucker from unloading without your supervision. Only specified operators should have keys to the locks.
- **Checklists** - A system of checklists that your operator must complete before each chemical delivery is accepted. A check list should require your operator to confirm the name of the chemical by reviewing the shipping papers and the placarding of the truck or tank car. A check list also can be used to confirm that proper PPE is used, and that the volume being delivered does not exceed your storage capacity. The operator should “sign-off” after the delivery is completed, and a supervisor should review these forms.

Compounds containing ammonia or ammonia hydroxide solution can also react violently and may produce dangerous gases such as chlorinated amines. Organic chemicals or fuels also may react violently or explosively. Any accidental blending of another chemical with bleach potentially can cause a dangerous reaction.