

# Chlor-Alkali Safety Tips for Your Plant

*These recommendations are not meant to be inclusive of all measures that should be taken to ensure plant safety. The WCC, its member associations, and the association's member companies, jointly and severally, make no guarantee and assume no liability for this information.*

## *Always ...*

- Always make sure all equipment and packaging is free of organic oils and greases before entering chlorine service!**
- Always use only oil-free compressors in chlorine systems!**
- Always use only recommended lubricants in chlorine services!**
- Always maintain dew points below  $-40^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$ ) in systems before putting into chlorine services!**
- Always maintain dew points below  $-40^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$ ) in air addition systems for chlorine services!**
- Always minimize flashing of liquid chlorine in case there is a high level of nitrogen trichloride ( $\text{NCl}_3$ )!**
- Always remove chlorine as a liquid or mix with inert solvent before flashing!**
- Always clean piping and equipment in sodium hydroxide services, and acidize metal surfaces prior to welding, cutting, or performing other forms of heat treatment!**
- Always add sodium hydroxide *TO* water when mixing both components!**
- Always consider cooling systems when sodium hydroxide and water are mixed!**
- Always follow established procedures and review critical procedures on a schedule pre-planned for your facility!**
- Always share learning experiences from near miss incidents with unit personnel!**
- Always investigate all process safety incidents and share findings with other units!**
- Always understand what your emergency plan is for the unit!**
- Always understand the process 'lines of defense'!**

## *Never ...*

- Never allow systems containing hydrogen to reach explosive limits of chlorine in hydrogen!**
- Never expose titanium to chlorine with insufficient moisture!**
- Never operate a chlorine system with carbon steel equipment above  $300^{\circ}\text{F}$  ( $150^{\circ}\text{C}$ )!**
- Never allow chlorine to come into contact with organic oils and greases!**
- Never allow a chlorine system to reach nitrogen trichloride ( $\text{NCl}_3$ ) concentrations above 20,000 ppm!**
- Never allow a hydrogen system to operate above oxygen limits defined for your facility's process!**
- Never operate a chlorine cell with cell voltage higher than the manufacturer's recommended voltage.**
- Never allow electrical busbars to operate above the recommended temperature range!**
- Never allow moisture or water to enter dry chlorine systems!**
- Never allow dry chlorine systems to operate above pre-determined moisture levels!**
- Never acidify hypochlorite streams in open to atmosphere systems!**
- Never flow 98% sulfuric acid at high velocities in carbon steel piping!**
- Never allow heat tracings on sulfuric acid to go above  $100^{\circ}\text{F}$  ( $38^{\circ}\text{C}$ ) for carbon steel equipment!**
- Never mix sodium hydroxide and acids in concentrated forms!**
- Never store 50% sodium hydroxide solution in carbon steel vessels above  $120^{\circ}\text{F}$  ( $50^{\circ}\text{C}$ )!**
- Never use in sodium hydroxide services equipment made out of aluminum, tin, copper, zinc!**
- Never bypass safety devices. Obtain engineering authorization to use any alternate procedures!**
- Never walk on cell covers when the cell alarms are activated!**