An AIChE Technology Alliance
CCPS Center for Chemical Process Safety

Process Safety Beacon

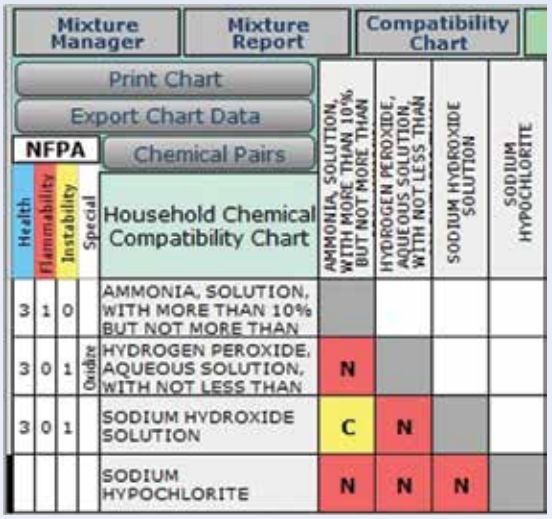
This Issue Sponsored by
AcuTech PROCESS RISK MANAGEMENT
www.acutech-consulting.com

Messages for Manufacturing Personnel
http://www.aiche.org/CCPS/Publications/Beacon/index.aspx

July 2016

Understand Chemical Compatibility

Chemical compatibility charts can be used to determine the chemical reactivity of thousands of common hazardous chemicals, the compatibility of absorbents, and the suitability of materials of construction in chemical processes. The compatibility chart at the right describes the potential hazards that could arise from mixing chemicals found in common household cleaners, including ammonia solution, hydrogen peroxide, sodium hydroxide, and sodium hypochlorite. This particular chart was generated using the Chemical Reactivity Worksheet (CRW) — a free software program offered by the Center for Chemical Process Safety (CCPS) (www.aiche.org/ccps/resources/chemical-reactivity-worksheet-40).



The chart indicates potential hazardous interactions between combinations of chemicals along the x-axis and y-axis. The red boxes containing the letter N signify incompatible chemicals and an expected hazardous interaction. The yellow box containing the letter C signifies that caution should be used when mixing the chemicals because the mixture may be hazardous under certain conditions. The figure displayed here is only a portion of the worksheet; the complete output of the CRW provides additional information about the potential hazardous interactions.

Similar chemical compatibility charts at plant sites describe the compatibility of materials specific to that plant. These are valuable tools that can help you understand what precautions are necessary to ensure that incompatible materials are not inadvertently mixed. Accidental mixing of materials can happen during material transfers, such as when shipments are being unloaded into storage tanks or other containers, when containers are stored adjacent to each other in warehouses or production areas, and when products are transferred to tank farms for storage prior to shipment.

What can you do?

- Be aware of the chemical reactivity hazards at your plant.
- Understand the safeguards in place at your plant to prevent hazardous mixing of incompatible materials.
- Follow your plant's procedures to prevent hazardous interactions between chemicals.
- If you haven't used a compatibility chart before, ask a more experienced engineer to explain how to use one.
- When transferring materials, verify the intended destination of the transfer. Proper labeling and verification could have prevented many mixing-related incidents.
- Read other Beacons describing incidents caused by mixing incompatible chemicals, including Aug. 2003, Aug. 2005, July 2006, March 2009, March 2011, April 2012, Dec. 2013, and June 2016.

Know what will happen when mixing chemicals!