Safety Scene: Storing Chemicals

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***Chem.Info*'s recurring Safety Scene feature focuses on how to improve safety in processing plants. In this installment, we highlight chemical storage safety.**

While processors may utilize several types of chemicals, ensuring proper storage is critical. By properly storing chemicals, processors can achieve several benefits including consistent inventory, maintaining a quality product and ensuring safety. By following the safety data sheet (SDS), material safety data sheet (MSDS) and suggested handling procedures processors can create and implement a safe chemical storage plan.

When working with customers, having a reliable storage system in place can provide processors with the opportunity to monitor their inventory while maintaining the intended state of the product. “Storing excipient products is important to ensure enough on-hand inventory is available for customer demand,” says Troy Hackett, director of enterprise risk management at Wilbur-Ellis Company. “Products not stored properly may be contaminated, adulterated or may exist past its shelf-life. Any of these scenarios may impact the quality and/or safety of the product.”

Jack Rubinger, Graphic Products, Inc., notes that chemicals can be stored for a manufacturing process that uses large amounts or for laboratories in small quantities. “If chemicals are not properly stored the following may occur: degradation and loss of essential chemical characteristics; harmful gases or vapors may be produced; fires or explosions; and container leakage and destruction,” he says.

Personnel and Premises Considerations

When establishing a chemical storage plan, processors must examine several aspects of the chemicals and the facility to ensure safe storage. While several storage standards are pertinent to all chemicals, it is also important for processors

to review the safety data sheet for each specific chemical storage requirement.

Hackett offers processors two key areas to consider when examining the proper way to store chemicals: personnel and premises. When exploring personnel, Hackett asks three questions. First, are personnel properly screened during the hiring process? Second, are personnel trained and have the requisite knowledge to safely store and handle the product? Finally, are personnel adequately supervised and managed to expectation on a daily basis?

Several steps are involved in making sure the premises are properly setup for storing chemicals. Hackett suggests processors consider several areas including restricting access to authorized personnel only, designing the premise to handle the chemical and physical characteristics of each product type, and establishing a housekeeping program with products being stored to allow for adequate cleaning in and around them.

A few other considerations Hackett mentions include a vermin and pest control program; separate storage area for rejected, expired, recalled and/or any returned products; and following First Expired/First Out.

It is also crucial to examine the special care certain chemicals may require. “Is the chemical flammable or combustible liquids; hazardous or sensitive products that might be subject to abuse or misuse; pressurized gasses, etc.?” Hackett says. “If so, special consideration and further safety requirements must be considered by reviewing the Material Safety Data Sheet as well as Federal, State and local regulations.”

The storage area of chemicals should be regularly checked. “Inspect storage areas of chemicals on a regularly scheduled basis to ensure the storage is sound and continues to meet the requirements of SDS,” Rubinger says. “In particular, look for corrosion and areas of potential leaks in containers. Look for problems in storage that may have been introduced by those using or transferring chemicals.”

Processors can also look for additional information on storing and transporting chemicals by reviewing the GHS Labeling practice guide here [1] or downloading the GHS webinar here [2].

Liquids, Solids and Gas

Chemical products come in various forms whether it is liquid, solid or gas. As a result, it is essential to make sure each type of chemical is handled and stored based on its specific requirements. Several factors must be considered when storing these different types of chemicals.

When storing liquid, solid or gas chemicals processors must consider the chemical, its intended use and other factors. “The method of storage depends, in part, on the physical state of the chemical,” Rubinger says. “However, the physical state is just one characteristic of the chemical that must be taken into account when determining how it is to be stored. For example, nitrogen gas is typically stored in a

cylinder. Liquid nitrogen is also stored in a cylinder. In this case, the storage method does not change with the physical state."

The storage environment is another aspect of chemical storage that must be determined. "The environment varies based on the chemical," Rubinger says. "Storage conditions that are right for one chemical may result in a disaster if another chemical is stored under those same conditions."

Rubinger also notes that some chemicals must be stored away from heat and direct sunlight while others must be stored in special, approved containers. By following the SDS for storage requirements, processors can learn the specific storage requirements.

With the presence of safe storage and handling practices available in the industry, processors are able to comply with the requirements presented in several industry documents. Hackett notes that as the world market for chemical products continues to grow, such practices are becoming solidified through regulations and standards. Additionally, there are also efforts being made to globally harmonize the storage and handling practices of chemical products.

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