SAFETY ALERT NO.1 /2023

DRY ICE STORAGE AND DISPOSAL

1. Background

Dry ice, the solid form of carbon dioxide (CO_2), is commonly used for rapid cooling of materials and keeping materials cool during transport. There are many forms of dry ice – pellets, flakes and solid blocks. Dry ice will sublimate (vaporise directly from solid form to a gaseous state) at any temperature above minus 79 $^\circ$C. Use of dry ice in poorly ventilated areas can result in the depletion of oxygen and the incorrect disposal of dry ice can severely damage plumbing.

2. Identified Hazard/s

Hazards associated with the use of dry ice include asphyxiation and burns. Skin contact with dry ice can lead to severe frostbite. When dry ice sublimates from solid state to gas state, large volumes of carbon dioxide gas are produced (1kg of dry ice can create over 540L of CO_2 gas), which can displace oxygen quickly causing difficulty breathing. Dry ice should not be placed in a sealed container that does not allow for the release of this gas as the build-up of pressure can cause the container to rupture or explode.

Due to the very low temperatures of water running over dry ice, direct contact with plumbing can cause damage.

3. Safety Measures/ Actions Required

When working with dry ice follow these following safety measures:

- store dry ice in a well-ventilated area – dry ice cannot be stored in a -20 freezer
- all packaging for storage of dry ice must allow for release of CO_2 gas
- Dry ice can be stored short term in an ultra-low temperature (minus 80 $^\circ$C) vented freezer that allows for release of gas
- always use appropriate eye (safety glasses or face shield) and skin protection (thermally insulated gloves) when handling dry ice, use tongs to handle dry ice, where possible
- dispose of dry ice in an open container in a well-ventilated area at room temperature, such as an operating fume cupboard

Do not use or store dry ice in confined areas or rooms without ventilation, such as air extraction/ exhaust systems, as carbon dioxide in high concentrations may cause asphyxiation.

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