Dry Ice Safety Meeting Kit

WHAT’S AT STAKE

Dry ice is the solid form of carbon dioxide, non-combustible, available in flakes, pellets, or block form. Dry ice will sublime (vaporizes directly to the gas state) at a temperature of -78.5 C (-109.3 F) or higher.

WHAT’S THE DANGER

HAZARDS OF DRY ICE

Contact. At -109 °F (-79 °C), skin contact with dry ice is can lead to severe frostbite; skin cells freeze and become damaged very quickly.

Asphyxiation. Dry ice will sublime (change from solid to gas) at any temperature above -109 °F. This releases potentially substantial volumes of CO2 (1 pound solid = 250 liters gas), which can displace oxygen quickly in the air around the dry ice, causing difficulty breathing, loss of consciousness and death. This is especially of concern in non- ventilated or confined spaces.

Explosion. Due to the rapid emission of large volumes of CO2 gas, any dry ice that is stored in a closed container can pressurize the container. Given enough time at normal room temperature, such a container may explode if the gas is not able to escape. Serious physical injury can occur due to improper packaging of dry ice.

Occupational Exposure Limits. Eight-hour, timeweighted average is 5,000 parts per million (ppm); 15- minute, short-term exposure limit is 30,000 ppm.

Walk-In Freezer. It is very dangerous to use dry ice in a walk-in freezer, cooler, closed truck bed, or other small space with poor ventilation. A large amount of dry ice in a walk-in cooler or freezer can produce a great deal of carbon dioxide, which can

possibly be fatal to someone entering that space.

HOW TO PROTECT YOURSELF

SAFETY CONTROL MEASURES WORKING WITH DRY ICE

- A comprehensive risk assessment is undertaken prior to the use, handling, and storage of any hazardous substances.
- appropriate controls are implemented to eliminate or minimize the risks associated with the use, handling, and storage of hazardous substances; and
- workers are provided with adequate information, training, and instruction in relation to the safe use, handling and storage of hazardous substances, the associated risks and the control measures implemented to control those risks.

DRY ICE OPERATIONS CHECKLISTS

Handling Dry Ice And PPE

- Wear appropriate eye protection, including goggles and/or a face shield, as well as a laboratory coat.
- Use tongs to handle dry ice when possible.
- Use loose-fitting, thermally insulated gloves to manually handle dry ice. Nitrile exam gloves will not provide enough protection. Never handle dry ice with bare hands.

Storage And Disposal

- Do not store dry ice in confined areas with limited ventilation. This includes cold rooms, walk-in refrigerators, and environmental chambers.
- Never store dry ice in a tightly sealed container, such as a plastic or glass bottle, or any container with a screw-top lid that will not vent. Styrofoam is an appropriate storage material since it is both insulated and not airtight.
- To dispose of dry ice, place it in a well-ventilated area at room temperature; the remainder of the ice will sublimate away.
- Never dispose of dry ice in a trash can, chemical waste

container or other garbage/waste can.
- Never dispose of dry ice in a sink, toilet, or other fixture; the temperature difference can destroy the plumbing.
- Do not leave dry ice unattended in open areas.

Transporting Dry Ice

- Only package dry ice in containers that are appropriate (i.e., non-sealable and not damaged by cold temperatures).
- All packaging must allow for release of CO2 gas. Never seal a container with dry ice in it.
- If you receive or see a container that appears swollen or bulging, or if you suspect dry ice is improperly placed in a sealed container, secure the area, and call 9-1-1. Do not try to release pressure on your own, which can cause serious injury.
- Plan to pick up Dry Ice as close as possible to the time it is needed.
- Bring a well insulated container such as a camping cooler, ice chest, or cold storage box.
- If it is transported inside a car or van, make sure there is a constant supply of fresh air.

Ventilation Requirements of Dry Ice

- Air is composed of 78% Nitrogen, 21% Oxygen and only 0.035% Carbon Dioxide. If the concentration of CO2 in the air rises above 0.5%, it becomes dangerous.
- Carbon Dioxide is heavier than air and will accumulate in low spaces. Do not enter closed Dry Ice storage areas without first ventilating the space.
- Limit your exposure to Dry Ice in the freezer and only enter as needed.

SPECIAL SAFETY MEASURES AND PRECAUTIONS: WHEN WORKING WITH DRY ICE

- do not store dry ice in a sealed, airtight container as the pressure resulting from the production of carbon dioxide gas may lead to an explosion.
- always use appropriate eye protection when handling dry ice.

- do not handle dry ice with bare hands.
- do not use or store dry ice in confined areas or rooms without ventilation as carbon dioxide in high concentrations may cause asphyxiation.

FINAL WORD

Anyone who handles dry ice should be aware of its unique properties and potential hazards. These include the extremely cold temperature, potential to create an oxygen-deficient atmosphere, and rapid conversion from a solid to gas.