UNMC

ENVIRONMENTAL HEALTH
AND SAFETY

Hazardous Material Fact Sheet
Dry Ice Handling

Dry ice, the solid form of carbon dioxide (CO_2), is commonly used in research settings. The properties of dry ice allow for the rapid cooling of materials and maintaining freezing environments but also pose unique hazards. Therefore, all individuals using dry ice must follow the safe storage, usage, handling, and disposal of dry ice. Refer to a Safety Data Sheet (SDS) before using dry ice. Consult with EHS for further guidance. Below are guidelines for how to work with dry ice safely.

HAZARDS OF DRY ICE

The main hazards of dry ice include frostbite and asphyxiation. Protect exposed skin from contact with dry ice. In addition, the use of dry ice in confined spaces (small rooms or walk-in coolers) or poorly ventilated areas can result in the depletion of oxygen, causing asphyxiation.

- **Contact Hazard:** At -109 °F (-79 °C), skin contact with dry ice can lead to severe frostbite; skin cells freeze and become damaged very quickly.
- **Asphyxiation Hazard:** Dry ice will change from solid to gas at any temperature above -109°F. This releases potentially substantial volumes of CO_2 (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 Hazard:** Due to the rapid emission of large volumes of CO_2 gas, any dry ice stored in a closed container can pressurize the container. Given enough time at normal room temperature, such a container may explode if the gas cannot escape. Serious physical injury can occur due to improper packaging of dry ice.

HANDLING DRY ICE

Dry ice can come in flake, pellet, or block forms. Dry ice is much colder than regular ice and can burn skin like frostbite. Use the following precautions when handling dry ice in any form.

- **Eye protection:** Always wear a full-face shield.
- **Skin protection:** Always wear a lab coat and loose-fitting, insulated gloves. Nitrile exam gloves will not provide enough protection.
- Avoid direct contact with skin.
- Use tongs or a scoop to handle dry ice.
- Never handle dry ice with bare hands.
- Never place dry ice in your mouth.

STORAGE

- Always store dry ice in a well-ventilated location and label all containers holding dry ice. You can purchase dry ice labels or use the EHS templates:
  - Dry Ice Signage Full Size
  - Dry Ice Signage Half Size
- Do not store dry ice in confined areas with limited ventilation, like storage closets, cold rooms, and walk-in refrigerators.
- Oxygen level monitoring may be required if large quantities of dry ice are being stored. Contact EHS for assistance.
- 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. As dry ice changes from its frozen state to a gaseous state, it may cause an airtight container to expand and potentially explode. Styrofoam coolers are an appropriate storage material since they are insulated and not airtight.
- Do not store dry ice in refrigerators, freezers, or ultra-low freezers.

DISPOSAL

- To dispose of dry ice, place it in a Styrofoam cooler 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.
- Do not dispose of dry ice in the sink, toilet, or other drain fixture; the temperature difference can ruin the plumbing.
- Do not leave dry ice in an unsecured area.

TRANSPORTING DRY ICE

Only package dry ice in appropriate containers (i.e., non-sealable and not damaged by cold temperatures). All packaging must allow for the release of CO_2 gas.

- Never seal a container with dry ice in it.
- When shipping commercially (e.g., FedEx, UPS, USPS), reference the EHS training webpage on Hazardous Materials/Dangers Goods Shipping.
- Only **trained** individuals can ship dry ice. Contact EHS to request training.

Please call 402.559.6356 or
email unmcehs@unmc.edu with any questions.