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Dry Ice Handling

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

The purpose of this procedure is to provide Beaumont Laboratory employees a guide to safely use, store, package, transport and dispose of Dry Ice.

The objective is to reduce risk to employees handling Dry Ice. Dry Ice is considered a hazard for three reasons:

A. **Explosion hazard**: Dry Ice releases a large volume of carbon dioxide gas as it sublimates (solid vaporizes to gas state). If packaged in a container that does not allow for the release of the gas, it may explode, causing personal injury or property damage.

B. **Suffocation hazard**: a large volume of carbon dioxide gas emitted in a confined space (e.g. transport vehicle with recirculated air), or other unventilated area (e.g. cold room) may create an oxygen deficient atmosphere.

C. **Contact hazard**: Dry Ice is a cryogenic material that causes severe frostbite upon contact with the skin or eyes.

II. PROCEDURE:

A. Safe use of Dry Ice
   1. Avoid eye or skin contact.
      a. NEVER handle Dry Ice with bare hands.
      b. When handling Dry Ice use heavy gloves and Dry Ice tongs or plastic scoop.
      c. Always use appropriate eye protection (e.g. goggles or face shield).
   2. Avoid use of Dry Ice in confined areas such as walk-in refrigerators, environmental chambers or rooms without ventilation. A leak in such areas could cause an oxygen-deficient atmosphere.

B. Safe storage of Dry Ice
   1. Do not store Dry Ice in confined areas such as walk-in refrigerators, environmental chambers or rooms without ventilation. A leak in such areas could cause oxygen-deficient atmosphere.
   2. Never place Dry Ice on tile or laminated surfaces because adhesive will be destroyed.

3. Never store Dry Ice in a sealed, airtight container at a temperature above the boiling point of the Dry Ice (-109^{o}F); the pressure resulting from production of carbon dioxide may lead to explosion.

C. Safe packaging of Dry Ice

1. Dry Ice is placed in an insulated container such as Styrofoam inserts and not placed directly in a cardboard box.
2. Samples should be surrounded by an absorbent material and then placed in a secondary containment.
3. Secure samples in a way when Dry Ice sublimes, samples will not move freely inside insulated box.
4. Minimize the volume of air Dry Ice is exposed in order to slow rate of sublimation. If there is any air space after you fill your package with Dry Ice, fill it with packaging peanuts or other material to reduce the volume of air space.
5. Outer packing (i.e. cardboard box) is free from damage. Do not use plastics or other brittle material for outer package.
6. Tape box in a way that will not interfere with gas release (e.g. Do not fully tape seams of the box).

D. Safe transport of Dry Ice

1. Packages should be transported in a secure position in a well-ventilated vehicle.
2. Product transported in an enclosed, non-ventilated compartment of a vehicle can present serious safety hazards. (e.g. Do not have vehicle ventilation control set to recirculate the air). If it is transported inside a car or van for more than 15 minutes make sure there is fresh air.

E. Safe disposal of Dry Ice

1. Dispose unneeded Dry Ice by letting the unused portion sublimate in a well-ventilated area.
2. NEVER dispose Dry Ice in a sink, toilet, or other device. Such action can destroy the structure because of the temperature difference.
3. NEVER dispose of Dry Ice in the trash or garbage.
4. NEVER leave unneeded Dry Ice in hallways or other public areas.

III. FIRST AID:

A. Skin Contact

1. Prolonged Dry Ice contact with the skin will freeze cells and cause injury similar to a burn. In case of exposure to Dry Ice, remove any clothing that is not frozen to the skin.
2. Do not rub frozen body parts because tissue damage may result.
3. Place the affected body part in a warm bath (not above 104^{o}F). NEVER use dry heat.
4. Obtain medical assistance as soon as possible.
5. Complete **Incident Report** On-Line. Injuries/Exposures will be documented on an Employee Incident Report (Go to Beaumont Intranet Home Page click on Application drop-down, Select Employee Health Incident Reporting Login).

B. Eye Contact

1. Immediately and briefly flush with lukewarm gently flowing water. DO NOT attempt to rewarm. Cover both eyes with sterile dressing. Treatment is urgently required.

2. Complete **Incident Report** On-Line. Injuries/Exposures will be documented on an Employee Incident Report (Go to Beaumont Intranet Home Page click on Application drop-down, Select Employee Health Incident Reporting Login).

C. Inhalation

1. Take precautions to secure your own safety before attempting to rescue. Treatment is urgently required.
2. Complete **Incident Report** On-Line. Injuries/Exposures will be documented on an Employee Incident Report (Go to Beaumont Intranet Home Page click on Application drop-down, Select Employee Health Incident Reporting Login).

IV. REFERENCES:

Laboratory Safety Cryogens and Dry Ice, Occupational Safety and Health Administration. www.osha.gov, OSHA Quick Facts, OSHA 3408 Rev. 10/2011

BOC a member of the Linde Group, Safety Data Sheet, Carbon dioxide, solid (Dry Ice), Issue date: 10.09.2014, Version: 1.1, SDS No:000010022548, last revised date: 24.02.2016

Attachments

No Attachments

Approval Signatures

Step Description	Approver	Date
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Policy and Forms Steering Committee Approval (if needed)	Deborah Poloch: Lab Quality Coord	2/5/2020
Operations Directors	Sarah Britton: Administrator, Laboratory Svcs	2/4/2020
Quality Best Practice	Jennie Green: Mgr Laboratory	12/16/2019
	Deborah Poloch: Lab Quality Coord	12/11/2019

Applicability

Dearborn, Farmington Hills, Grosse Pointe, Royal Oak, Taylor, Trenton, Troy, Wayne