Dry Ice Safety Awareness Training

Dry Ice Safety Guidelines
Hazards of Dry Ice

• Dry ice is the solid form of Carbon Dioxide (CO₂)
  • non-combustible, available in flakes, pellets or block form.

• As dry ice heats up, it sublimes into asphyxiant gas
  • Dry ice will sublimate about five to ten pounds every 24 hours (blocks last longer) in a typical storage cooler
  • Plan on purchasing dry ice as close as possible to the time needed.

• A small amount of dry ice can sublime into a large volume of gas
  • Dry ice will sublime (vaporizes directly to the gas state) at a temperature of -78.5 C (-109.3 F) or higher.
Hazards of Dry Ice

• Dry ice can be hazardous when used or stored in a confined space or when consumed in “smoke drinks”

• In well-ventilated areas, CO₂ gas dissipates and is harmless.
  • However, in confined or poorly ventilated spaces, CO₂ gas can accumulate and displace oxygen.

• Risks of CO₂ exposure include:
  • dizziness,
  • loss of consciousness
  • suffocation
- Normal air is composed of 78% nitrogen, 21% oxygen, and only 0.04% carbon dioxide.
- Concentrations greater than 0.5% (5000 ppm) can become dangerous.
- Therefore, handle dry ice in well-ventilated locations.
Safety Precautions

• Dry ice must be stored in a Styrofoam chest, insulated cooler, or a special cooler designed for the storage of dry ice.
  • The cooler must then be located in a well-ventilated place, such as the open lab.
  • NEVER store coolers in closets, cabinets, refrigerators, or walk in coolers/cold rooms.

• Due to the thermal expansion of dry ice (one pound of dry ice produces about 250 liters of gaseous carbon dioxide), sufficient gaseous carbon dioxide can be produced in a sealed container to cause an explosion.

• Dry ice is NEVER to be stored in any type of tightly sealed devices such as an ultra-low freezer or plastic/glass container.
Transporting Dry Ice

- You should avoid transporting dry ice in the cab of a truck or passenger compartment of a car when possible.
  - Shipping dry ice requires DOT training.

- If you must transport dry ice in the driver’s compartment, ensure the compartment is well-ventilated (window open)

- Make sure the container holding the dry ice is closed securely to minimize the release of gas

- Transporting dry ice in an insulated cooler will minimize off-gassing.

- Load and unload dry ice in a well-ventilated area.
How to Handle Dry Ice

- Wear thermal gloves when handling dry ice
- Store in a well-ventilated space
- Secure dry ice to prevent unauthorized access
- Do not store in tightly sealed containers
- Do not lean into or over any storage container storing dry ice
- Do not consume dry ice
Disposing of Dry Ice

- Let the unused portion sublime in a well-ventilated area

- Never dispose of dry ice in a sink or toilet

- Never dispose of dry ice in the trash or garbage

- Never leave unneeded dry ice in hallways or other public areas
Questions?

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Quiz link is on next slide
Video & Safety Quiz

Why is dry ice so dangerous? – VIDEO

Training Quiz & completion verification