

South Australian Mosquito and Arbovirus Surveillance

Standard Operating Procedure

Dry Ice handling & Safety

Health Protection Programs (HPP) has developed and coordinates the mosquito surveillance subsidy program throughout South Australia which is delivered by local council officers and contractors. In South Australia, adult mosquito surveillance is undertaken using encephalitis vector survey (EVS) traps. EVS traps use dry ice, a solid form of carbon dioxide (CO²), as a bait to attract female mosquitoes looking for an animal or human to bite. This standard operating procedure provides guidance in relation to the safe handling and use of dry ice.

Background

Unlike most solids, dry ice transforms directly into a gas (sublimation) from the frozen state. Dry ice sublimates (changes to a gas) at temperatures at or above -78°C. The main hazards of dry ice include asphyxiation, frost burns or explosion/rupture if stored in a sealed container. To ensure appropriate controls are in place, please refer to this document or consider referring to the safety data sheet (SDS) for dry ice.

Personal protective equipment

Personal protective equipment (PPE) in good condition should always be worn when handling dry ice. Insulated gloves, eye protection (safety glasses or face shield), closed shoes, long sleeved clothing and full-length trousers should be worn.

Storage

When dry ice sublimates CO² gas may cause difficulty breathing or suffocation. CO² is heavier than air and accumulates in poor ventilated areas.

- > Do not store dry ice in confined rooms or spaces (including vehicles) without ventilation.
- > Do not store dry ice in walk in cool rooms or freezers. Dry ice can release gas in these types of environments and displace oxygen, which can cause headaches, nausea, breathing difficulties and at worst asphyxiation.
- > Do not place dry ice in an airtight container. If dry ice is packed in an airtight container, fridge, freezer, or anywhere that does not allow the release of gas, containers may explode as ice rapidly expands to a gas when exposed to temperatures above -78°C.
- > Dry ice containers should be kept only in places with good ventilation. Be sure the area is well ventilated when working with or storing dry ice. This includes transport and storage in vehicles.
- > Ensure room doors and windows (where possible) are open to allow air exchange. If dry ice has been in a closed area, open doors and allow adequate ventilation for at least 5 minutes prior to entering.
- > If shortness of breath is experienced or a headache develops, these may be signs of exposure to CO². Leave the area immediately.



Handling

- > Avoid direct skin contact with dry ice. Wear appropriate PPE covering any exposed skin area.
- > Do not touch dry ice with bare hands, use insulated gloves when handling dry ice to prevent cold burns and frostbite.
- > Use a rigid scoop or jug to move dry ice from container to EVS trap.
- > Avoid eye contact by wearing appropriate eye protection.
- > Do not put dry ice in your mouth, it is harmful if eaten or swallowed.
- > Do not place dry ice directly on some surfaces. Dry ice can react with surfaces like stone top counters or some laminate style counter tops as it can cause cracking/damage to these surfaces.

Transportation

Due to sublimation, and resulting distribution of CO₂, dry ice must be transported in a well-ventilated vehicle or in a part of a vehicle separate to the occupants, for example in the rear of a utility vehicle where the storage area is separate from the cab.

- > The most suitable container for the transport of dry ice is a foam esky or similar that is not tightly sealed. The better insulated the container, the slower the sublimation.
- > The dry ice storage container should be kept as cool as possible during transport and out of direct sunlight as this will reduce sublimation.

Disposal

Once the dry ice is no longer needed, open the container, and leave it at room temperature in a well-ventilated and secure area. The dry ice will readily sublimate from a solid to a gas.

- > DO NOT leave dry ice in an unsecured area, dry ice needs to be kept away from the public and regularly monitored.
- > DO NOT drain or flush in a sink, basin, or toilet, as the temperature difference may ruin the plumbing.
- > DO NOT dispose into general waste.
- > DO NOT place in a closed area or cool room or freezer.

First aid

- > After inhalation: relocate to an area where there is fresh air. Seek medical attention if symptoms develop, such as breathing difficulty. To protect rescuer, use an Air-line respirator or Self-Contained Breathing Apparatus (SCBA). Apply artificial respiration if not breathing. Give oxygen if available.
- > After skin contact: flush affected area with lukewarm water (not hot water). Do not rub the affected area. seek medical attention especially if blisters start to form on skin.
- > After eye contact: flush eyes with lukewarm water for 15 mins. Remove contact lenses if worn. Contact an eye specialist.
- > For further information on first aid measures refer to product SDS.

Equipment and materials

Item	Quantity
Insulated gloves	1
Eye protection	1
Long sleeved shirt	1
Full length trousers	1
Esky	1
Scoop	1

References

- SA Pharmacy Procedure - *COVID-19 Immunisation Safe Dry Ice and Manual Handling Management Procedure*. SA Pharmacy 19 January 2021
- SafeWork SA - *Dry ice handling and storage*. 24/12/2020
- Grainger Inc, Editorial Staff - *Dry Ice Safety Tips: Storage, Handling and Disposal*. 12/14/20. <https://www.grainger.com/know-how/safety-health/management/kh-tips-handling-dry-ice-safely>.
- Dry Ice SDS Dry Ice Australia - <https://dryiceaustralia.net.au/docs/Dry-Ice-Australia-SDS.pdf>.

For more information

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