



# Dry Ice

## Safety information



It is Nippon Gases Duty of Care to inform you, Our Customer, of these standards regarding Dry Ice, it is your duty of care to inform any of your customers/employees, whom may come into contact with Dry Ice. This leaflet may be freely utilised and distributed to this end and may serve to protect the user from harm through cold contact or misuse of the product.



Over recent years the use of Dry Ice as a cooling aid for home delivery has become popular, this introduces the general public to handling Dry Ice. Nippon Gases recommends that Dry Ice safety information is passed on to the end user (your customer).

As a minimum we would suggest that the outside of any transshipment box or container indicates that it contains Dry Ice and that relevant safety information for use / disposal is included or available online.



Please see page 4 and 5 for further guidance.



## SAFETY HAZARDS



### Carbon dioxide gas can build up in vehicles

- Dry Ice will generate carbon dioxide gas and in an enclosed vehicle can lead to a dangerous atmosphere causing intoxication and death by asphyxiation.
- Higher temperatures in the vehicle and poor ventilation will increase the speed of carbon dioxide gas build up.



### Dry Ice can move in vehicles

- Containers or packages of Dry Ice can cause injury and damage if they can move when the vehicle is cornering or braking.
- Any unrestrained Dry Ice container or package is a hazard.



### Dry Ice can be heavy and difficult to handle

- Containers of Dry Ice can weight up to 700KG, Packages can weigh up to 25KG.
- During loading or unloading, injuries can occur from falling containers and packages, and from incorrect manual handling.
- Additional hazards from overloading the vehicle or unbalanced loading are poor vehicle braking and handling.



### Dry Ice cold & pressure hazards

- Dry Ice is very cold  $-78^{\circ}\text{C}$ , if it touches bare skin or eyes it will cause cold burns.
- Exposure of plastics and other hard materials to Dry Ice may lead to them becoming brittle and shattering.
- If Dry Ice is put in a sealed container, pressure will build up to dangerous levels.



### Product Hazards

- Labels show the hazards and weight from packages containing Dry Ice, and are the only way to positively identify the contents of a container.



### TRANSPORT REGULATIONS

- Dry Ice is exempt from the ADR transport regulations.
- If carrying Dry Ice on commercial aircraft or other forms of passenger transport check how the relevant Transport Regulations apply to you.

## HOW TO STAY SAFE



### Prevent gas build-up

- Minimise the time Dry Ice is in the vehicle. A dangerous level of carbon dioxide can build up in less than 20 minutes.
- Minimise the quantity of Dry Ice carried in non dedicated vehicles.
- Carrying Dry Ice in passenger cars is not recommended.
- Unload the vehicle as soon as possible - never store Dry Ice in an unventilated vehicle.



### Ensure all containers are well secured

- Ensure containers and packages are evenly loaded and secured to prevent movement during cornering, acceleration and emergency braking.
- Ensure vehicle is not overloaded.



### Loading and unloading

- For heavy containers use mechanical aids or get help to load and unload the vehicle.
- Wear safety shoes.
- Read the product Safety Data Sheet and labels to understand the hazards of the substance you are handling.



### Avoid other Dry Ice hazards

- Always wear gloves that provide thermal protection when handling Dry Ice.
- Handle Dry Ice for the minimum amount of time possible.
- Individuals with poor blood circulation should not handle Dry Ice.
- Never put Dry Ice in a sealed container, to avoid pressure build up.

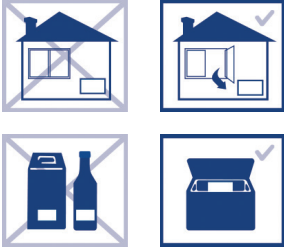


### EMERGENCY ACTIONS

- If you feel unwell or suspect a build up of carbon dioxide:
  - Stop the vehicle as soon as possible and get out.
  - Ventilate the vehicle - open all the doors.
- If you suspect a gas build up in a parked vehicle, do not get in it.

Call your Dry Ice supplier for further advice and a copy of their Safety Data Sheet.

## STORAGE



### Always store Dry Ice in an area which is:

- Well ventilated.
- Preferably not below ground.
- Accessible with mechanical lifting equipment (where the ice is stored in large containers).
- Out of direct sunlight and sources of heat.
- Secure – to prevent unauthorised access.
- Suitable Dry Ice containers are available from your supplier. Generally, the principle is – the better the insulation, the slower the sublimation rate and the longer the quality of the product will be maintained.
- **DO NOT** store or use Dry Ice in any gas tight container. Within large containers, gas rich atmospheres will have built up.
- **ALWAYS** secure the container lid open before reaching in to unload the product.
- **AVOID** leaning into the container for longer than necessary.

## HANDLING



### Working with Dry Ice

- Many applications of Dry Ice result in the sublimation of the Dry Ice volume into the working area.
- **REMEMBER** – a little bit of Dry Ice will sublime to a large volume of CO<sub>2</sub> gas.
- **ALWAYS** seek professional advice on suitable ventilation systems. Use of Dry Ice will generate gaseous CO<sub>2</sub>. This may require assessment under the UK COSHH Regulations.
- Do not handle Dry Ice with bare hands. It can cause severe cold burns and frostbite.
- **DO NOT** play with Dry Ice. Playing games with Dry Ice is dangerous.
- **ALWAYS** keep Dry Ice away from children.
- USE AN INSULATED CONTAINER TO STORE Dry Ice
- DO NOT PLACE IN WORKING REFRIGERATOR OR FREEZER

## DISPOSAL

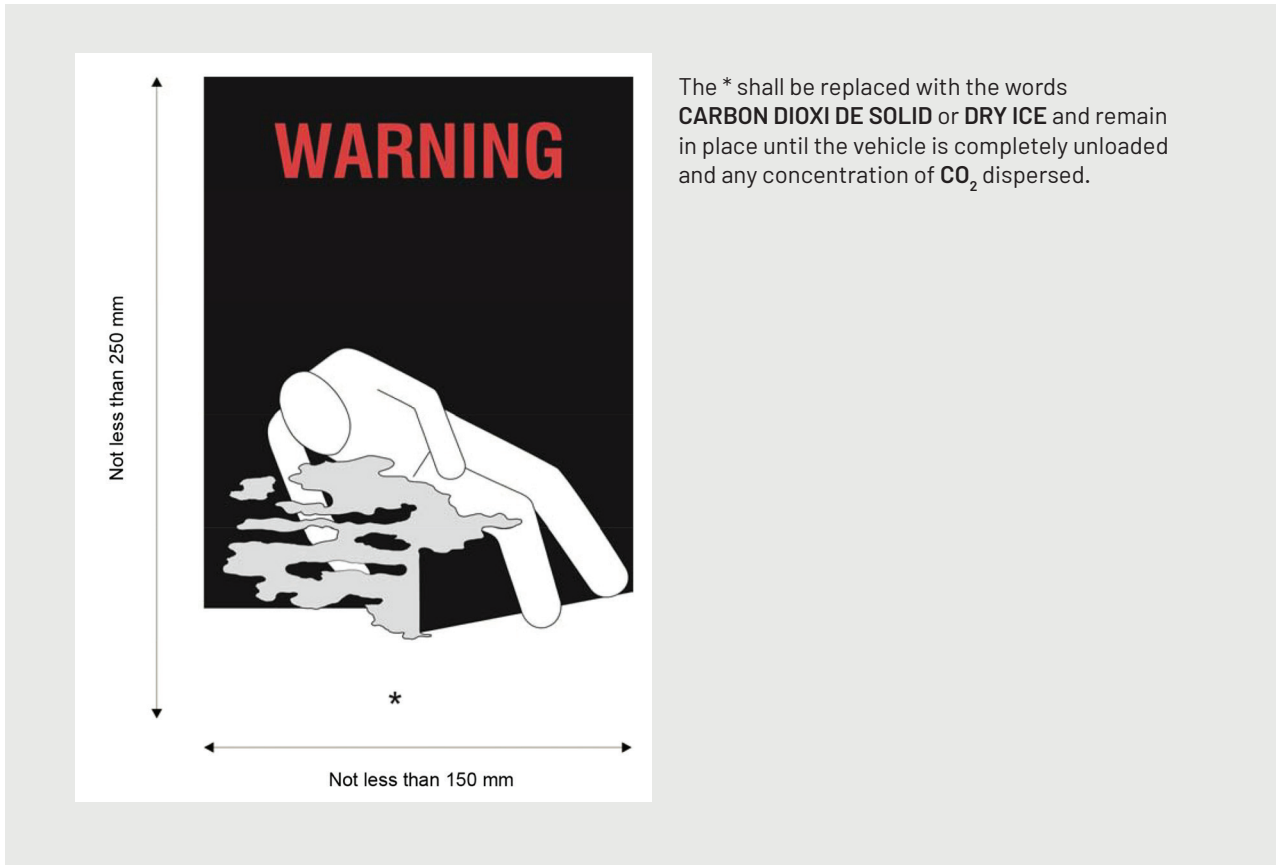
### Safe Disposals

- Dry Ice sublimates leaving no residue. However, care should be taken when surplus ice remains when the application for which it was intended is completed.
- **ALWAYS** ensure that Dry Ice is disposed of in a safe place:
  - » Well-ventilated area
  - » Secured against access to passers-by – especially children and animals
- **DO NOT** dispose of Dry Ice in an area where CO<sub>2</sub> gas can collect in low-lying areas – garage pits, drains, confined spaces, etc.
- Any left over packaging should be disposed of with care and recycled wherever possible.

Call your Dry Ice supplier for further advice and a copy of their Safety Data Sheet.

# Marking of packages containing CO<sub>2</sub>/Dry Ice

1. Packages shall be marked with the words **CARBON DIOXIDE SOLID** or **DRY ICE**
2. Packages must be carried in well ventilated vehicles, IF that cannot be achieved then a warning mark shall be fixed near the door to the load area as shown :



3. A document, not specifically a DGN but any form of consignment note, BoL etc.. shall include the UN Number and Name **"UN 1845 CARBON DIOXIDE SOLID** or **UN 1845 DRY ICE**

# Nippon Gases UK

## Nippon Gases UK – Dry Ice

Nippon Gases UK has the two biggest Dry Ice production plants within the UK operating 364 days per year, with secure liquid CO<sub>2</sub> sourcing options, it makes us the natural choice for reliable Dry Ice supply.

Dry Ice is carbon dioxide (CO<sub>2</sub>) in its solid state. The product has a temperature of -78.6 °C (-109.5 °F), whereas traditional water ice is only 0 °C. Dry Ice is produced by compressing and cooling gaseous CO<sub>2</sub> into liquid, and then allowing it to expand to produce CO<sub>2</sub> snow. The snow is then compressed by a hydraulic press into convenient sized blocks, slices and pellets.

At Nippon Gases, we develop the right product for the right applications. Give us a call and we'll help you determine the best supply option for your operations.

## Nippon Gases Europe in a Nutshell

The company in Europe has presence in 13 countries: Belgium, Denmark, France, Germany, Netherlands, Ireland, Italy, Norway, Poland, Portugal, Spain, Sweden and United Kingdom. At the present, in Europe has more than 2700 employees and more than 100,000 customers.

Nippon gases Europe is part of the Taiyo Nippon Sanso Corporation, Japan's leading industrial gases producer. The Company has built a broad business portfolio encompassing a diverse range of industrial gases, as well as related equipment, facilities and technologies, worthy of its corporate slogan, "The Gas Professionals", through which it has contributed to the advancement of both industry and humanity.

Looking ahead, Taiyo Nippon Sanso will continue working to ensure safe and stable supplies of industrial gases, with the aim of helping realise a healthy and prosperous society

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