

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Trade name : Carbon dioxide, solid (Dry ice)  
 SDS no : YPX018C  
 Chemical description : Carbon dioxide, solid (Dry ice)  
 CAS-No. : 124-38-9  
 EC-No. : 204-696-9  
 EC Index-No. : ---  
 Registration-No. : Listed in Annex IV / V REACH, exempted from registration.  
 Chemical formula : CO<sub>2</sub>

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.  
 Cooling (Food additive E290).  
 Blast cleaning.  
 Metal cooling.  
 Contact supplier for more information on uses.  
 Uses advised against : In beverage for fogging effect, because of the risk of ingestion.

#### 1.3. Details of the supplier of the safety data sheet

Company identification : Nippon Gases Norge AS  
 Ringnesveien 50  
 N-0915 Oslo - NORWAY  
 T +47 97 77 42 77  
[www.nippongases.no](http://www.nippongases.no)  
[kundeservice@nippongases.com](mailto:kundeservice@nippongases.com)

#### 1.4. Emergency telephone number

Country	Official advisory body	Address	Emergency number	Comment
Norway	Giftinformasjonen (Norwegian Poisons Information Center) HelseDirektoratet	P.O. Box 7000 St. Olavs Plass 0130 Oslo	+47 22 591300	24 hours a day

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]  
 Not regulated.

#### 2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]  
 Not applicable

#### 2.3. Other hazards

: Asphyxiant in high concentrations.  
 Refrigerated solidified gas. Contact with product may cause cold burns or frostbite.  
 In high concentrations CO<sub>2</sub> causes rapid circulatory insufficiency even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and death.

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Carbon dioxide, solid (Dry ice)	(CAS-No.) 124-38-9 (EC-No.) 204-696-9 (EC Index-No.) --- (Registration-No.) *1	100	Not classified

Contains no other components or impurities which will influence the classification of the product.

\*1: Listed in Annex IV / V REACH, exempted from registration.

\*3: Registration not required: Substance manufactured or imported < 1t/y.

**3.2. Mixtures** : Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
- Skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Eye contact : Adverse effects not expected from this product.
- Ingestion : Get immediate medical attention.

### 4.2. Most important symptoms and effects, both acute and delayed

- : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
- Low concentrations of CO<sub>2</sub> cause increased respiration and headache.
- Refer to section 11.

### 4.3. Indication of any immediate medical attention and special treatment needed

- : None.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

- Suitable extinguishing media : Not applicable.
- Unsuitable extinguishing media : Not applicable.

### 5.2. Special hazards arising from the substance or mixture

- Hazardous combustion products : None.

### 5.3. Advice for firefighters

- Specific methods : Use fire control measures appropriate for the surrounding fire.

Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus.  
Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.  
Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

: Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.  
Ensure adequate air ventilation.  
Act in accordance with local emergency plan.  
Stay upwind.

### 6.2. Environmental precautions

: None.

### 6.3. Methods and material for containment and cleaning up

: Sweep up and collect in a suitable container .  
Ventilate area.

### 6.4. Reference to other sections

: See also sections 8 and 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Safe use of the product : For more guidance on safe use, refer to the EIGA Doc.150 "Code of practice Dry Ice" downloadable at <http://www.eiga.eu>. and consult your supplier.  
The product must be handled in accordance with good industrial hygiene and safety procedures.  
Refer to supplier's container handling instructions.  
Do not smoke while handling product.  
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.  
Do not breathe gas.  
Do not handle solid Carbon Dioxide with bare hands. Use protective gloves against cold, dry ice tongs or plastic scoop or shovel. Handle blocks of dry ice carefully, as injuries can occur if one is accidentally dropped on the feet.

### 7.2. Conditions for safe storage, including any incompatibilities

: Observe all regulations and local requirements regarding storage of containers.  
Store containers in location free from fire risk and away from sources of heat and ignition.  
Keep away from combustible materials.  
Containers of solid Carbon Dioxide should be stored upright in vented rooms at room temperature and be firmly secured to prevent falling or being knocked over. Storage containers and equipment used with solid Carbon Dioxide should not be located in sub-surface or enclosed areas. Storage of dry ice should never occur in a gas-tight container.

### 7.3. Specific end use(s)

: None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

<b>Carbon dioxide, solid (Dry ice) (124-38-9)</b>		
OEL : Occupational Exposure Limits		
Norway	TWA (NO) OEL 8h [mg/m <sup>3</sup> ]	9000 mg/m <sup>3</sup>
	TWA (NO) OEL 8h [ppm]	5000 ppm
	Merknader (NO)	E (EU har en veiledende grenseverdi for stoffet)
	Regulatory reference	FOR-2018-08-21-1255

DNEL (Derived-No Effect Level) : None available.

PNEC (Predicted No-Effect Concentration) : None available.

### 8.2. Exposure controls

#### 8.2.1. Appropriate engineering controls

- : Provide adequate general and local exhaust ventilation.
- Ensure exposure is below occupational exposure limits (where available).
- Consider the use of a work permit system e.g. for maintenance activities.
- CO2 detectors should be used when CO2 may be released.

#### 8.2.2. Individual protection measures, e.g. personal protective equipment

- : A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:  
PPE compliant to the recommended EN/ISO standards should be selected.

- Eye/face protection : Wear safety glasses with side shields.  
Standard EN 166 - Personal eye-protection - specifications.
- Skin protection :  
- Hand protection : Wear safety gloves.  
Standard EN 388 - Protective gloves against mechanical risk.  
Standard EN 511 - Cold insulating gloves.  
- Other : Wear safety shoes while handling containers.  
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres.  
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
- Thermal hazards : None in addition to the above sections.

#### 8.2.3. Environmental exposure controls

- : None necessary.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

#### Appearance

- Physical state : Refrigerated solidified gas
- Physical state at 20°C / 101.3kPa : Gas
- Colour : White.

Odour : Odourless.

Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
pH	: Not applicable.
Melting point / Freezing point	: -78.5 °C At atmospheric pressure dry ice sublimates into gaseous carbon dioxide.
Boiling point	: -56.6 °C
Flash point	: Not applicable.
Evaporation rate	: Not applicable.
Flammability (solid, gas)	: Non flammable.
Explosive limits	: Non flammable.
Vapour pressure [20°C]	: 57.3 bar(a)
Vapour pressure [50°C]	: Not applicable.
Vapour density	: Not applicable.
Relative density, liquid (water=1)	: 1.03
Relative density, gas (air=1)	: 1.52
Water solubility	: 2000 mg/l
Partition coefficient n-octanol/water (Log Kow)	: 0.83
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: Not applicable.
Viscosity	: No reliable data available.
Explosive properties	: Not applicable.
Oxidising properties	: Not applicable.
<b>9.2. Other information</b>	
Molar mass	: 44 g/mol
Critical temperature [°C]	: 30 °C
Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

: No reactivity hazard other than the effects described in sub-sections below.

### 10.2. Chemical stability

: Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

: None.

### 10.4. Conditions to avoid

: None.

### 10.5. Incompatible materials

: None.

### 10.6. Hazardous decomposition products

: None.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

<b>Acute toxicity</b>	: Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. 5% CO <sub>2</sub> has been found to act synergistically to increase the toxicity of certain other gases (CO, NO <sub>2</sub> ). CO <sub>2</sub> has been shown to enhance the production of carboxy- or met-hemoglobin by these gases possibly due to carbon dioxide's stimulatory effects on the respiratory and circulatory systems. For more information, see 'EIGA Safety Info 24: Carbon Dioxide, Physiological Hazards' at <a href="http://www.eiga.eu">www.eiga.eu</a> .
<b>Skin corrosion/irritation</b>	: No known effects from this product.
<b>Serious eye damage/irritation</b>	: No known effects from this product.
<b>Respiratory or skin sensitisation</b>	: No known effects from this product.
<b>Germ cell mutagenicity</b>	: No known effects from this product.
<b>Carcinogenicity</b>	: No known effects from this product.
<b>Toxic for reproduction : Fertility</b>	: No additional information available
<b>Toxic for reproduction : unborn child</b>	: No additional information available
<b>STOT-single exposure</b>	: No known effects from this product.
<b>STOT-repeated exposure</b>	: No known effects from this product.
<b>Aspiration hazard</b>	: Not applicable.

## SECTION 12: Ecological information

### 12.1. Toxicity

Assessment	: No ecological damage caused by this product.
EC50 48h - Daphnia magna [mg/l]	: No data available.
EC50 72h - Algae [mg/l]	: No data available.
LC50 96 h - Fish [mg/l]	: No data available.

### 12.2. Persistence and degradability

Assessment	: No ecological damage caused by this product.
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### 12.3. Bioaccumulative potential

Assessment	: No ecological damage caused by this product.
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### 12.4. Mobility in soil

Assessment	: No ecological damage caused by this product.
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### 12.5. Results of PBT and vPvB assessment

Assessment	: Not classified as PBT or vPvB.
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### 12.6. Other adverse effects

Other adverse effects	: No known effects from this product.
Effect on the ozone layer	: None.
Global warming potential [CO <sub>2</sub> =1]	: 1
Effect on global warming	: Contains greenhouse gas(es). When discharged in large quantities may contribute to the greenhouse effect.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended)

**13.2. Additional information**

Discharge to atmosphere in large quantities should be avoided.  
Do not discharge into any place where its accumulation could be dangerous.

: None.

: None.

**SECTION 14: Transport information**

**14.1. UN number**

UN-No. : 1845

**14.2. UN proper shipping name**

**Transport by road/rail (ADR/RID)** : Not subject to ADR except for section 5.5.3.

**Transport by air (ICAO-TI / IATA-DGR)** : Carbon dioxide, solid

**Transport by sea (IMDG)** : CARBON DIOXIDE, SOLID (DRY ICE)

**14.3. Transport hazard class(es)**

**Transport by air (ICAO-TI / IATA-DGR)**

Class / Div. (Sub. risk(s)) : 9

**Transport by sea (IMDG)**

Class / Div. (Sub. risk(s)) : 9

Emergency Schedule (EmS) - Fire : F-C

Emergency Schedule (EmS) - Spillage : S-V

**14.4. Packing group**

Transport by road/rail (ADR/RID) : Not applicable

Transport by air (ICAO-TI / IATA-DGR) : Not applicable

Transport by sea (IMDG) : Not applicable

**14.5. Environmental hazards**

Transport by road/rail (ADR/RID) : None.

Transport by air (ICAO-TI / IATA-DGR) : None.

Transport by sea (IMDG) : None.

**14.6. Special precautions for user**

**Packing Instruction(s)**

Transport by air (ICAO-TI / IATA-DGR)

Passenger and Cargo Aircraft : 954.

Cargo Aircraft only : 954.

Transport by sea (IMDG) : P003

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment.  
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.  
Before transporting product containers:  
- Ensure there is adequate ventilation.  
- Ensure that containers are firmly secured.

**14.7. Transport in bulk according to Annex II of Marpol and the IBC Code**

: Not applicable.

**SECTION 15: Regulatory information**

**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

**EU-Regulations**

Restrictions on use : None.  
Seveso Directive : 2012/18/EU (Seveso III) : Not covered.

**National regulations**

National legislation : Ensure all national/local regulations are observed.

**15.2. Chemical safety assessment**

: A CSA does not need to be carried out for this product.

**SECTION 16: Other information**

Section	Changed item	Change	Comments
1.3	Company identification	Modified	New company name

Abbreviations and acronyms : ATE - Acute Toxicity Estimate  
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008  
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006  
EINECS - European Inventory of Existing Commercial Chemical Substances  
CAS# - Chemical Abstract Service number  
PPE - Personal Protection Equipment  
LC50 - Lethal Concentration to 50 % of a test population  
RMM - Risk Management Measures  
PBT - Persistent, Bioaccumulative and Toxic  
vPvB - Very Persistent and Very Bioaccumulative  
STOT- SE : Specific Target Organ Toxicity - Single Exposure  
CSA - Chemical Safety Assessment  
EN - European Standard  
UN - United Nations  
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road  
IATA - International Air Transport Association  
IMDG code - International Maritime Dangerous Goods  
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail  
WGK - Water Hazard Class

Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.  
For more guidance, refer to EIGA SL 01 "Dangers of Asphyxiation", downloadable at <http://www.eiga.eu>.



DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Details given in this document are believed to be correct at the time of going to press.

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.