

Safety Data Sheet

SECTION 1 – IDENTIFICATION

Name, Address, and Telephone of the Responsible Party

Dyno Nobel Inc.

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SDS #: 1118

Date: 05/12/2015

Supersedes: 12/20/2012

Product Identifier

Product Form: Substance

Product Name: Carbon Dioxide, Refrigerated Liquid

Other Means of Identification

Synonyms:

Carbonic Acid

Carbonic Anhydride

CO₂

Liquefied CO₂

Intended Use of the Product

Industrial use.

Emergency Telephone Number

FOR 24 HOUR EMERGENCY, CALL CHEMTREC (USA) 800-424-9300

CANUTEC (CANADA) 613-996-6666

SECTION 2 – HAZARD(S) IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US)

Simple Asphy

H380

Refrigerated liquefied gas

H281

Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US)



GHS04

Signal Word (GHS-US)

: Warning

Hazard Statements (GHS-US)

: H281 - Contains refrigerated gas; may cause cryogenic burns or injury.

H380 - May displace oxygen and cause rapid suffocation.

Precautionary Statements (GHS-US)

: P282 - Wear cold insulating gloves/face shield/eye protection.

P315 - Get immediate medical advice/attention.

P336 - Thaw frosted parts with lukewarm water. Do not rub affected area.

P403 - Store in a well-ventilated place.

Other Hazards

Hazards Not Otherwise Classified (HNOC): Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Asphyxiant gas, can be fatal. This gas is odorless; carbon dioxide has no warning properties. Can result in increased respiration, dizziness, shortness of breath and headache. Exposure to high concentrations for a period of time can result in oxygen deficiency, effects of which may include rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgment, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma and death. Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

Other Hazards: Not available

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SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Substances

| Name | Product Identifier | % (w/w) | Ingredient Classification (GHS-US) |
|----------------|--------------------|---------|--|
| Carbon dioxide | (CAS No) 124-38-9 | 99.9 | Simple Asphy, H380 Refrigerated liquefied gas, H281 |

Full text of H-phrases: see section 16

SECTION 4 - FIRST AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention.

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER/doctor/physician if you feel unwell.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation persists. Thaw frosted parts with lukewarm water. Do not rub affected area.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention immediately.

Ingestion: Rinse mouth. Do NOT induce vomiting. Get immediate medical attention.

Most Important Symptoms and Effects Both Acute and Delayed

General: May cause frostbite on contact with the liquid. Carbon dioxide is an asphyxiant. Lack of oxygen can be fatal.

Inhalation: Gas can be toxic as a simple asphyxiant by displacing oxygen from the air. Asphyxia by lack of oxygen: risk of death. May cause drowsiness or dizziness.

Skin Contact: Contact with the liquid may cause cold burns/frostbite.

Eye Contact: This gas is non-irritating; but direct contact with liquefied/pressurized gas or frost particles may produce severe and possibly permanent eye damage from freeze burns.

Ingestion: Ingestion is not considered a potential route of exposure. Non-irritating, but solid and liquid forms of this material and pressurized gas may cause freeze burns.

Chronic Symptoms: None known.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention.

SECTION 5 - FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not flammable.

Explosion Hazard: Product is not explosive. Containers may rupture and rocket when exposed to excessive heat.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Hazardous Combustion Products: Carbon oxides (CO, CO₂).

Reference to Other Sections: Refer to section 9 for flammability properties.

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SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Avoid breathing gas. Use only outdoors or in a well-ventilated area. Ruptured cylinders may rocket. Do not allow product to spread into the environment.

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Ventilate area. Evacuate unnecessary personnel. Stop leak if safe to do so.

Environmental Precautions

Avoid release to the environment.

Methods and Material for Containment and Cleaning Up

For Containment: Notify authorities if refrigerated liquid enters sewers or public waters.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely. Isolate area until gas has dispersed. Use water spray to disperse vapors. For water based spills contact appropriate authorities and abide by local regulations for spills into waterways. Contact competent authorities after a spill.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection

SECTION 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Do not pressurize, cut, or weld containers. Do not puncture or incinerate container. Liquid gas can cause frost-type burns.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work. Do not eat, drink or smoke when using this product.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Keep container tightly closed. Keep/Store away from extremely high or low temperatures, incompatible materials. Store in original container.

Incompatible Materials: Strong oxidizers. Reactive metals such as potassium, sodium, magnesium. Peroxides.

Specific End Use(s)

Industrial use.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

Carbon dioxide (124-38-9)

| | | |
|------------------|---------------------------------------|-------------------------|
| USA ACGIH | ACGIH TWA (ppm) | 5000 ppm |
| USA ACGIH | ACGIH STEL (ppm) | 30000 ppm |
| USA OSHA | OSHA PEL (TWA) (mg/m ³) | 9000 mg/m ³ |
| USA OSHA | OSHA PEL (TWA) (ppm) | 5000 ppm |
| USA NIOSH | NIOSH REL (TWA) (mg/m ³) | 9000 mg/m ³ |
| USA NIOSH | NIOSH REL (TWA) (ppm) | 5000 ppm |
| USA NIOSH | NIOSH REL (STEL) (mg/m ³) | 54000 mg/m ³ |
| USA NIOSH | NIOSH REL (STEL) (ppm) | 30000 ppm |
| USA IDLH | US IDLH (ppm) | 40000 ppm |

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Exposure Controls

Appropriate Engineering Controls: Ensure adequate ventilation, especially in confined areas. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure all national/local regulations are observed.

Personal Protective Equipment: Protective goggles. Protective clothing. Respiratory protection of the dependent type. Insulated gloves.



Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves. Insulated gloves.

Eye Protection: Chemical goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing

Respiratory Protection: In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear a self-contained breathing apparatus (SCBA).

Thermal Hazard Protection: Wear suitable protective clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

| | |
|---|---|
| Physical State | : Gas |
| Appearance | : Colorless gas. |
| Odor | : No odor. |
| Odor Threshold | : Not available |
| pH | : Not available |
| Evaporation Rate | : Not available |
| Melting Point | : Not available |
| Freezing Point | : Not available |
| Boiling Point | : Not available |
| Flash Point | : Not available |
| Auto-ignition Temperature | : Not available |
| Decomposition Temperature | : Not available |
| Sublimation Point | : -78°C (-109°F) @ 1 atm |
| Flammability (solid, gas) | : Not available |
| Lower Flammable Limit | : Not available |
| Upper Flammable Limit | : Not available |
| Vapor Pressure | : 60 atm (881.4 psia) @ 22.4°C (72.3°F) |
| Relative Vapor Density at 20 °C | : 1.522 (air=1) |
| Relative Density | : Not available |
| Specific Gravity | : 1.02 g/cm ³ (8.5 lb/gal) |
| Solubility | : Water: 0.14 g/100ml @ 0°C (32°F) |
| Partition Coefficient: N-Octanol/Water | : Not available |
| Viscosity | : Not available |
| Explosion Data – Sensitivity to Mechanical Impact | : Not expected to present an explosion hazard due to mechanical impact. |
| Explosion Data – Sensitivity to Static Discharge | : Not expected to present an explosion hazard due to static discharge. |

SECTION 10 - STABILITY AND REACTIVITY

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Reactivity: Hazardous reactions will not occur under normal conditions.
Chemical Stability: Stable at standard temperature and pressure.
Possibility of Hazardous Reactions: Hazardous polymerization will not occur.
Conditions to Avoid: Extremely high or low temperatures. Incompatible materials.
Incompatible Materials: Strong oxidizers. Reactive metals such as potassium, sodium, magnesium. Peroxides.
Hazardous Decomposition Products: Carbon oxides (CO, CO₂).

SECTION 11 - TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity: Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not classified

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: Gas can be toxic as a simple asphyxiant by displacing oxygen from the air. Asphyxia by lack of oxygen: risk of death. May cause drowsiness or dizziness.

Symptoms/Injuries After Skin Contact: Contact with the liquid may cause cold burns/frostbite.

Symptoms/Injuries After Eye Contact: This gas is non-irritating; but direct contact with liquefied/pressurized gas or frost particles may produce severe and possibly permanent eye damage from freeze burns.

Symptoms/Injuries After Ingestion: Ingestion is not considered a potential route of exposure. Non-irritating, but solid and liquid forms of this material and pressurized gas may cause freeze burns.

Chronic Symptoms: None known.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data: Not available

SECTION 12: ECOLOGICAL INFORMATION

Toxicity Not classified

Persistence and Degradability

Carbon Dioxide, Refrigerated Liquid

Persistence and Degradability Product is biodegradable.

Bioaccumulative Potential

Carbon Dioxide, Refrigerated Liquid

Bioaccumulative Potential Not expected to bioaccumulate.

Carbon dioxide (124-38-9)

BCF fish 1 (no bioaccumulation)

Log Pow 0.83

Mobility in Soil Not available

Other Adverse Effects

Other Adverse Effects: Can cause frost damage to vegetation, aquatic animals, aquatic life.

Other Information: Avoid release to the environment.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national,

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provincial, territorial and international regulations.

Additional Information: Empty gas cylinders should be returned to the vendor for recycling or refilling.

SECTION 14 - TRANSPORT INFORMATION

In Accordance with DOT

Proper Shipping Name : CARBON DIOXIDE, REFRIGERATED LIQUID
 Hazard Class : 2.2
 Identification Number : UN2187
 Label Codes : 2.2



ERG Number : 120

In Accordance with IMDG

Proper Shipping Name : CARBON DIOXIDE, REFRIGERATED LIQUID
 Hazard Class : 2.2
 Identification Number : UN2187
 Label Codes : 2.2
 EmS-No. (Fire) : F-C
 EmS-No. (Spillage) : S-V



In Accordance with IATA

Proper Shipping Name : CARBON DIOXIDE, REFRIGERATED LIQUID
 Identification Number : UN2187
 Hazard Class : 2
 Label Codes : 2.2



ERG Code (IATA) : 2L

In Accordance with TDG

Proper Shipping Name : CARBON DIOXIDE, REFRIGERATED LIQUID
 Hazard Class : 2.2
 Identification Number : UN2187
 Label Codes : 2.2



SECTION 15 - REGULATORY INFORMATION

US Federal Regulations

Carbon Dioxide, Refrigerated Liquid

SARA Section 311/312 Hazard Classes

Immediate (acute) health hazard
 Sudden release of pressure hazard

Carbon dioxide (124-38-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

US State Regulations

Carbon dioxide (124-38-9)

U.S. - Massachusetts - Right To Know List
 U.S. - New Jersey - Right to Know Hazardous Substance List
 U.S. - Pennsylvania - RTK (Right to Know) List

Canadian Regulations

Carbon dioxide (124-38-9)

Listed on the Canadian DSL (Domestic Substances List)
 Listed on the Canadian IDL (Ingredient Disclosure List)



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IDL Concentration 1 %

WHMIS Classification Class A - Compressed Gas

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 05/12/2015

Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200.

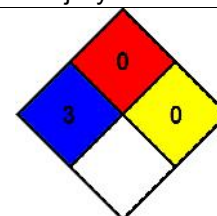
GHS Full Text Phrases:

| | |
|----------------------------|--|
| Compressed gas | Gases under pressure Compressed gas |
| Refrigerated liquefied gas | Gases under pressure Refrigerated liquefied gas |
| Simple Asphy | Simple Asphyxiant |
| H280 | Contains gas under pressure; may explode if heated |
| H281 | Contains refrigerated gas; may cause cryogenic burns or injury |

NFPA Health Hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

NFPA Fire Hazard : 0 - Materials that will not burn.

NFPA Reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



Party Responsible for the Preparation of This Document

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