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## Product Safety Data Sheet (PSDS)

The gas cylinder products referenced in this PSDS document are consumer products. Gas cylinders under 50ml capacity are considered “articles” under the Global Harmonized System and are exempted from the GHS labeling and SDS classification criteria. This PSDS document is provided as service in response to requests for information on gas cylinder use, safety and regulatory compliance.

### SECTION 1 — PRODUCT IDENTIFICATION

<b>Product Name</b>	DISPOSABLE CARBON DIOXIDE CARTRIDGES
<b>Product Identification</b>	Gas Cylinders; Receptacles Small, Containing Gas; Disposable Carbon Dioxide Cartridges
<b>Product Use</b>	Propellant source for Non-powdered projectile gun
<b>PSDS Date of Preparation</b>	2015/09/09, Revised 2021/02/01
<b>Document ID</b>	PSDS_CO2_EUR_50ML_UN2037
<b>Company Identification</b>	1F, No. 429, Sec. 6, Yen Ping N. Rd., Shih-Lin Taipei, 111070 Taiwan

### SECTION 2 — HAZARD IDENTIFICATION

<b>OSHA/HCS status</b>	This material is considered “articles” by the OSHA Hazard Communication Standard (29 CFR 1910.1200) and is exempted from the OSHA/HCS labeling criteria.
<b>DOT status</b>	This material is a container for carbon dioxide with no more than 4 fluid ounces of capacity and is considered “ORM-D” or “Consumer Commodity” by the Department of Transportation (49 CFR 172.101 and 173.306). This material is exempted from the DOT labeling criteria, except when offered for transportation or transported by air.
<b>GHS status</b>	This material is considered “articles” by the Global Harmonized System and is exempted from the GHS labeling and SDS classification criteria.
<b>Precautionary statements</b>	
<b>General</b>	Read and follow all Product Safety Data Sheets (PSDS’S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Use equipment rated for cylinder pressure. Do not puncture until connected to equipment prepared for use. Do not remove until contents is empty. Do not throw into fire. Use only equipment of compatible materials of construction.
<b>Prevention</b>	Use and store outdoors or in a well ventilated place.
<b>Response</b>	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
<b>Storage</b>	Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

<b>Disposal</b>	Dispose in accordance with all applicable regulations. Do not incinerate unless content is empty.
<b>Hazards not otherwise classified</b>	In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation. May cause frostbite.

## SECTION 3 — COMPOSITION AND INGREDIENTS

<b>Substance / Mixture</b>	Substance
<b>Chemical Name</b>	Carbon Dioxide
<b>Synonyms</b>	Carbonic, Carbon Dioxide, Carbon Anhydride, CO <sub>2</sub>
<b>CAS Number</b>	124-38-9
<b>Content (vo%)</b>	99.8 % or more

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

## SECTION 4 — FIRST AID INFORMATION

### Descriptions of necessary first aid measures

<b>Inhalation</b>	Remove exposed person to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular, or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
<b>Skin Contact</b>	Carbon dioxide is harmless at atmospheric pressure. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
<b>Eye Contact</b>	Carbon dioxide is harmless at atmospheric pressure. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
<b>Ingestion</b>	Refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

<b>Inhalation</b>	No known significant effects or critical hazards.
<b>Skin Contact</b>	No known significant effects or critical hazards.
<b>Eye Contact</b>	No known significant effects or critical hazards.
<b>Frostbite</b>	Try to warm up the frozen tissues and seek medical attention.
<b>Ingestion</b>	Refer to the inhalation section.

Over-exposure signs/symptoms

<b>Inhalation</b>	No specific data.
<b>Skin Contact</b>	No specific data.
<b>Eye Contact</b>	No specific data.

<b>Ingestion</b>	No specific data.
Indication of immediate medical attention and special treatment needed, if necessary	
<b>Notes to physician</b>	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
<b>Specific treatments</b>	No specific treatment.
<b>Protection of first-aiders</b>	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

## SECTION 5 — FIRE FIGHTING INFORMATION

### Extinguishing media

Suitable extinguishing media Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media No specific treatment.

Specific hazards arising from the chemical Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products Decomposition products may include the following materials:  
Carbon dioxide  
Carbon monoxide

Special protective actions for fire-fighters Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters Fire-fighters should wear appropriate equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## SECTION 6 — ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

For non-emergency personnel No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

**Small spill** This material contains no more than 40grams of carbon dioxide, in case of spill, allow carbon dioxide to vent naturally. Do not handle the cylinder without protective gloves as it may cause frostbite.

**Large spill** This material contains no more than 40grams of carbon dioxide, in case of spill, allow carbon dioxide to vent naturally. Do not handle the cylinder without protective gloves as it may cause frostbite.

## SECTION 7 — HANDLING AND STORAGE

### Precaution for safe handling

#### Protective measures

Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

#### Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

#### Conditions for safe storage, including any incompatibility

Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52°C (125°F).

## SECTION 8 — EXPOSURE CONTROLS / PERSONAL PROTECTION

This material contains no more than 40 grams of Carbon Dioxide. Although unlikely to result in serious exposures, the following Control parameters Occupational exposure limits are provided for regulatory purpose.

### Control parameters

#### Occupational exposure limits

Ingredient name	Exposure Limits
Carbon Dioxide	<p>ACGIH TLV (United States, 3/2012). Oxygen Depletion [Asphyxiant].                      STEL: 54000 mg/m<sup>3</sup> 15 minutes.                      STEL: 30000 ppm 15 minutes.                      TWA: 9000 mg/m<sup>3</sup> 8 hours                      TWA: 5000 ppm 8 hours.</p> <p>NIOSH REL (United States, 1/2013).                      STEL: 54000 mg/m<sup>3</sup> 15 minutes.                      STEL: 30000 ppm 15 minutes.                      TWA: 9000 mg/m<sup>3</sup> 8 hours                      TWA: 5000 ppm 8 hours.</p> <p>OSHA PEL (United States, 6/2010).                      TWA: 9000 mg/m<sup>3</sup> 8 hours                      TWA: 5000 ppm 8 hours.</p> <p>OSHA PEL 1989 (United States, 3/1989).                      STEL: 54000 mg/m<sup>3</sup> 15 minutes.                      STEL: 30000 ppm 15 minutes.                      TWA: 9000 mg/m<sup>3</sup> 8 hours                      TWA: 5000 ppm 8 hours</p>

#### Appropriate engineering controls

Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

#### Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

#### Precautions for safe handling

#### Protective measures

Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous.

#### Individual protection measure

#### Hygiene measure

Wash hands, forearms and face thoroughly after handling chemical products, before eating,

smoking, using the lavatory and at the end of your shift.

Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/Face protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
Skin protection Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

### Appearance

Physical state	Gas at normal temperature and pressure
Color	Colorless
Molecular weight	44.01g/mol
Molecular formula	C-O <sub>2</sub>
Melting/freezing point	Sublimation temperature: -79°C (-110.2°F)
Critical temperature	30.85°C (87.5°F)
Odor	Odorless
Odor threshold	Not available
pH	Not available
Flash point	[Product does not sustain combustion]
Burning time	Not available
Burning rate	Not available
Evaporation rate	Not available
Flammability (solid, gas)	Not available
Lower and upper explosive (flammable) limits	Not available
Vapor pressure	830 psig
Vapor density	1.53 (Air = 1), Liquid Density@BP: Solid Density = 97.5 lb/ft <sup>3</sup> (1562 kg/m <sup>3</sup> )
Specific volume	8.7719 ft <sup>3</sup> /lb (m <sup>3</sup> /g)
Gas density	0.114 lb/ft <sup>3</sup> (178.6 g/m <sup>3</sup> )

Relative density	Not available
Solubility	Not available
Solubility in Water	Not available
Partition coefficient	0.83
n-octano / water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
SADT	Not available
Viscosity	Not available

## SECTION 10 — STABILITY AND REACTIVITY

Reactivity	No specific test data related to reactivity is available for this product or its ingredients.
Chemical stability	The product is stable
Possibility of hazardous reaction	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data.
Hazardous decomposition	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization	Under normal conditions of storage and use, hazardous polymerization will not occur.

## SECTION 11 — TOXICOLOGICAL INFORMATION

### Information on toxicological effects

Acute toxicity	Not Available
Irritation / Corrosion	Not available
Sensitization	Not available
Mutagenicity	Not available
Carcinogenicity	Not available
Reproductive toxicity	Not available
Teratogenicity	Not available
Specific target organ toxicity (single exposure)	Not available
Specific target organ toxicity (repeated exposure)	Not available
Aspiration hazard	Not available
Information on the likely route of exposure	Not available

### Potential acute health effects

<b>Eye contact</b>	No known significant effects or critical hazards.
<b>Inhalation</b>	No known significant effects or critical hazards.
<b>Skin contact</b>	No known significant effects or critical hazards.
<b>Ingestion</b>	Since this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical, and toxicological characteristics

**Eye contact** No specific data.  
**Inhalation** No specific data.  
**Skin contact** No specific data.  
**Ingestion** No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

**Short term exposure**

Potential immediate effects Not available  
Potential delayed effects Not available

**Long term exposure**

Potential immediate effects Not available  
Potential delayed effects Not available

Potential chronic health effects — Not available

**General** No known significant effects or critical hazards.  
**Carcinogenicity** No known significant effects or critical hazards.  
**Mutagenicity** No known significant effects or critical hazards.  
**Teratogenicity** No known significant effects or critical hazards.  
**Developmental effects** No known significant effects or critical hazards.  
**Fertility effects** No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimate Not available

## SECTION 12 — ECOLOGICAL INFORMATION

Toxicity Not available  
Persistence and degradability Not available

Bioaccumulative potential

Product / Ingredient name	Log $P_{ow}$	BCF	Potential
Carbon Dioxide	0.83	-	low

Mobility in soil

Soil/Water partition coefficient ( $K_{oc}$ ) Not available  
Other adverse effects Not available

## SECTION 13 — DISPOSAL CONSIDERATIONS

**Discharge of Carbon Dioxide** Gradually release in open air.  
**Disposal of Cylinders** If gas remains in cylinders, release gas with proper equipment and recycle cylinders as recyclable steel.

Verify for puncture hole.

Do not dispose or recycle without first checking that all gas has been released and there is a puncture hole on the cylinder.



## SECTION 14 — TRANSPORT INFORMATION

<b>IMO IMDG 39-18</b>	Receptacles, Small, Containing Gas (Gas Cartridges)
<b>UN Number</b>	UN 2037
<b>Hazard Class</b>	2
<b>Labels</b>	2.2
<b>Special Shipping Information</b>	This product conforms to <b>Special Provision 191 of IMDG 39-18</b> : Receptacles with a capacity not exceeding 50 mL containing only non-toxic constituents are <b>not subject to the provisions of this Code</b> .
<b>IATA DGR 62th (2021)</b>	Receptacles Small, Containing Gas (Gas Cartridges)
<b>UN Number</b>	UN 2037
<b>Hazard Class</b>	2.2
<b>Labels</b>	2.2
<b>Special Shipping Information</b>	This product conforms to <b>Special Provision A98 of IATA DGR 62th</b> : Aerosols, gas cartridges and receptacles, small, containing gas with a capacity not exceeding 50 mL, containing no constituents subject to these Regulations other than a Division 2.2 gas, <b>are not subject to these Regulations when carried as cargo</b> unless their release could cause extreme annoyance or discomfort to crew members so as to prevent the correct performance of duties. The words "Not Restricted" and the Special Provision number must be included in the description of the substance on the Air Waybill as required by 8.2.6, when an Air Waybill is issued.
<b>ADR 2019</b>	Receptacles Small, Containing Gas (Gas Cartridges)
<b>UN Number</b>	UN 2037
<b>Classification Code</b>	5 A
<b>Labels</b>	2.2
<b>Special Shipping Information</b>	This product conforms to <b>Special Provision 191 of ADR 2019</b> : Receptacles with a capacity not exceeding 50 mL containing only non-toxic constituents are <b>not subject to the provisions of ADR</b> .

## SECTION 15 — REGULATORY INFORMATION

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable international and domestic (including but not limited to federal, state, and local) regulations.

**U.S. Federal Regulations**

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

This material is considered "articles" by the OSHA Hazard Communication Standard (29 CFR 1910.1200) and is exempted from the OSHA/HCS labeling criteria.

This material is a container for carbon dioxide with no more than 4 fluid ounces of capacity and is considered "ORM-D" or "Consumer Commodity" by the Department of Transportation (49 CFR 173.101 and 173.306). This material is exempted from the DOT labeling criteria, except when offered for transportation or transported by air.

**SARA 311/312 Hazardous Categories**

Fire hazard	NO
Sudden release of pressure	YES
Reactive	NO
Immediate (acute) health hazard	NO
Delayed (chronic) health hazard	NO

**State Regulations**

Massachusetts	This material is listed
New Jersey	This material is listed
Pennsylvania	This material is listed
California	This material is listed Not regulated under CA Proposition 65.

**SECTION 16 — OTHER INFORMATION****Hazard Rating Systems****NFPA Ratings**

Health = 2  
Flammability = 0  
Reactivity = 0  
Special = SA

**HMIS Ratings**

Health = 1  
Flammability = 0  
Physical Hazard = 3

**Key to abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
BCF	Bioconcentration Factor
CAS	Chemical Abstract Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	United States Code of Federal Regulations
DOT	Department of Transportation
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
Log $P_{ow}$	Logarithm of the octanol/water partition coefficient
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Healthy Organizaton
STEL	Short-term Exposure Limit

SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average

**DISCLAIMER:** This PSDS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by the KRONYO Stamping Industry Corp. and its affiliates to be dependable and is accurate to the best of the Company's knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations.

This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. The KRONYO Stamping Industry Corp. and its affiliates assume no responsibility for injury to the recipient or third persons, or for any damage to any property resulting from misuse of the product.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee they are the only hazards that exist.

