

G. S. M. MATERIAL SAFETY DATA SHEETS

1. CHEMICAL PRODUCT

PRODUCT NAME: Carbon Dioxide Cylinder
Company name: G-Shang Metal Corporation
ADDRESS: No. 58, Fusiang Lane, Chang-An Road, Tachia District, Taichung City 437, Taiwan, R.O.C.
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2. HAZARD IDENTIFICATION

HAZARD IDENTIFICATION : Pressurized CO2 gas cylinder containing beverage quality CO2
EMERGENCY OVERVIEW: Warning! Do not permit physical damage or overheating of cylinders. Oxygen levels below 19.5% may cause asphyxia. Carbon dioxide exposure can cause nausea and respiratory problems. High concentrations may cause vasodilation leading to circulatory collapse.
Effects of a Single (Acute) Overexposure- INHALATION: May cause asphyxia. Eye Contact: Gas or liquid or solid carbon dioxide may cause severe frostbite. May cause stinging sensation; may cause irritation. Skin Contact: May cause frostbite with redness, tingling, pain or numbness. Ingestion: May be harmful if swallowed. May cause frostbite damage to lips, mouth and mucous membranes may occur. Target Organs: Simple Asphyxiant. Poisoning may affect heart, respiratory and nervous system. Signs and Symptoms: Signs may include discomfort or pain, with redness, tingling, pain or numbness. Symptoms may include frostbite, redness; the skin may become hard, white and develop blisters. Chronic: Repeated exposure may cause chilblain. Other Effects of Overexposure. Damage to retinal or ganglion cells and central nervous system may occur. Medical Conditions Aggravated by Overexposure. The toxicology and the physical and chemical properties of carbon dioxide suggest that overexposure is unlikely to aggravate existing medical conditions. CARCINOGENICITY: Carbon dioxide is not listed by NTP, OSHA, or IARC. POTENTIAL ENVIRONMENTAL EFFECTS: None known. For further information, see section 12, Ecological Information.

3. COMPOSITION, INFORMATION ON INGREDIENTS

PRODUCT NAME: Carbon Dioxide Cylinder
INGREDIENTS: CARBON DIOXIDE
CAS NUMBER: 124-38-9
Concentration : Liquefied CO2 99.99%
UN Number: 1013
Use: for carbonating water for beverages.

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4. FIRST AID MEASURES

<p>Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.</p> <p>Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.</p> <p>Skin Contact: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. In case of frostbite, warm affected skin in warm water. If warm water is unavailable, gently wrap affected area in a blanket. Allow circulation to return naturally and obtain immediate medical attention.</p>
<p>INGESTION: If Do not induce vomiting unless directed to go so by medical personnel. Never give anything by mouth to an unconscious person. Treat symptomatically and get medical attention.</p>
<p>NOTE TO PHYSICIAN: None.</p>

5. FIRE FIGHTING MEASURES

<p>FLASH POINT: Non-flammable.</p>
<p>AUTOIGNITION TEMPERATURE: -</p>
<p>FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not applicable. Upper (UEL): Not applicable</p>
<p>UNUSUAL FIRE AND EXPLOSION HAZARDS: -</p>
<p>Explosion Sensitivity to Mechanical Impact: Not sensitive. Explosion Sensitivity to Static Discharge: Not sensitive.</p>
<p>Fire Fighting Instructions: Use an extinguishing agent suitable for surrounding fires. If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.</p> <p>Fire Fighting Equipment: Wear full turnout gear with self-contained breathing apparatus. Extinguishing Media: Dry Chemical, carbon dioxide (CO₂), or halon. For larger fires, use water spray, fog or standard foam.</p> <p>Hazardous Combustion Products: Oxides of carbon. Oxides of nitrogen.</p> <p>Special Information: None</p>

6. ACCIDENTAL RELEASE MEASURES

<p>CLEAN UP PROCEDURES: Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.</p> <p>Personal Precautions: Carbon dioxide is an asphyxiant gas. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off leak if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.</p>
<p>SPECIALIZED EQUIPMENT: None</p>

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7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Do not puncture or incinerate container. Wash thoroughly after handling. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; don't drag and roll. Do not attempt to refill spent cartridges. Ventilation should be provided, it is recommended to use protective equipment if multiple cylinders are released in a confined space.

Storage: Keep container tightly closed. Keep container in a well-ventilated area. Avoid breathing product vapor or mist. Store in a cool dry place, away from heat, sparks, flame and direct sunlight. Keep out of reach of children.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure limit values: IDLH: 40,000 ppm
STEL: 30,000 ppm 15 minute(s)
TWA: 5000 ppm 8 hour(s)

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Local exhaust ventilation is preferred, because it prevents gas dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the level of oxygen.

EYE 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 or dusts.

CLOTHING: For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

Hand Protection: Wear suitable gloves.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: In case of insufficient ventilation, wear suitable respiratory equipment.

General Hygiene Considerations: Handle in accordance with good industrial hygiene and safety practices.

OTHER PROTECTIVE EQUIPMENT: Safety shoes when handling cylinders.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND COLOR: Colorless, odorless,	ODOR: odorless
ODOR THRESHOLD: Not applicable.	BOILING POINT @ 1 atm: -78.55°C (-109.4°F)
VAPOR PRESSURE: 830 psig	VAPOR DENSITY (air=1): 1.5
SPECIFIC GRAVITY (water=1): 1.52 @ 21° C	COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
EVAPORATION RATE: Not applicable	MOLECULAR WEIGHT: 44.01 g/mole

10. STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure..

CONDITIONS TO AVOID: Avoid contact with incompatible materials and avoid exposing cylinders to extremely high temperatures, which could cause the cylinders to rupture or burst.

HAZARDOUS DECOMPOSITION: Electrical discharges and high temperatures decompose carbon dioxide into carbon monoxide and oxygen.

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11. TOXICOLOGICAL INFORMATION

LETHAL CONCENTRATION (LC50):

Carbon dioxide is an asphyxiant. It initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:

EFFECT: CONCENTRATION:

Breathing rate increases slightly. 1%

Breathing rate increases to 50% above normal level.

Prolonged exposure can cause headache, tiredness. 2%

Breathing increases to twice normal rate and becomes labored. Weak narcotic effect. Impaired hearing, headache, increased blood pressure and pulse rate. 3%

Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt. 4 - 5%

Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired, followed within minutes by loss of consciousness. 5 - 10%

Unconsciousness occurs more rapidly above 10% level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation. 10 - 100%

LETHAL DOSE 50 (LD50): N/Ap

TERATOGENICITY: There is no evidence that carbon dioxide is teratogenic in humans.

REPRODUCTIVE EFFECTS: A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different times during gestation.

MUTAGENICITY: -

BIOLOGICAL EXPOSURE INDICES (BEIs): -

12. ECOLOGICAL INFORMATION

ECOTOXICITY: No known effects.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. TRANSPORT INFORMATION

ID NUMBER: UN2187

PROPER SHIPPING NAME: Carbon dioxide

HAZARD CLASS OR DIVISION: 2.2

LABELING REQUIREMENTS: 2.2

SPECIAL PRECAUTIONS: Cylinders should be transported in a secure upright position in a well ventilated truck.

ADR/TDGR/49cfr 172.101 CLASS: 2

DESCRIPTION FOR TRANSPORT DOCUMENTS: UN 1013 Carbon dioxide 2.2

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15. REGULATORY INFORMATION

1. 49cfr178.46 (DOT-3AL-1800psi cylinder specification)
2. CAN/CSA-B339-02 (TC-3ALM-124 cylinder specification)
3. Registration number: M0816

16. OTHER INFORMATION

OTHER PRECAUTIONS:	When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.
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MSDS Date of Preparation:2021.01.15	
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