

Print MSDS Sheet

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SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MG INDUSTRIES
3 GREAT VALLEY PARKWAY
MALVERN, PENNSYLVANIA 19355
PHONE: 610-695-7400
FAX: 610-695-7596
SUBSTANCE: CARBON DIOXIDE, GAS
TRADE NAMES/SYNONYMS:
CARBONIC ACID GAS; CARBONIC ANHYDRIDE; CARBON DIOXIDE; CARBON OXIDE; STCC
4904535; UN 1013; CO2; MGI04260; RTECS FF6400000
CHEMICAL FAMILY: oxides of carbon
CREATION DATE: May 04 1990
REVISION DATE: Mar 22 2001

EMERGENCY CONTACT:
CHEMTREC:
1-800-424-9300

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: CARBON DIOXIDE, GAS
CAS NUMBER: 124-38-9
EC NUMBER (EINECS): 204-696-9
PERCENTAGE: 100

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:

PHYSICAL DESCRIPTION: Colorless, odorless gas, with a slight acidic taste.

MAJOR HEALTH HAZARDS: difficulty breathing

PHYSICAL HAZARDS: Containers may rupture or explode if exposed to heat.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: ringing in the ears, nausea, irregular heartbeat,
headache, drowsiness, dizziness, tingling sensation, visual disturbances,
suffocation, convulsions, coma

LONG TERM EXPOSURE: no information on significant adverse effects

SKIN CONTACT:

SHORT TERM EXPOSURE: blisters, frostbite

LONG TERM EXPOSURE: no information on significant adverse effects

EYE CONTACT:

SHORT TERM EXPOSURE: irritation, blurred vision

LONG TERM EXPOSURE: no information on significant adverse effects

INGESTION:

SHORT TERM EXPOSURE: frostbite

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LONG TERM EXPOSURE: no information is available

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is

not available, gently wrap affected parts in blankets. Get immediate medical attention.

EYE CONTACT: Flush eyes with plenty of water.

INGESTION: If a large amount is swallowed, get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk.

Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out.

Apply water from a protected location or from a safe distance. Do not get water directly on material. Reduce vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Do not touch spilled material. Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.

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SECTION 7 HANDLING AND STORAGE

STORAGE: Cylinder temperature should not exceed 125 F (52 C).

29 CFR Subpart "H"-Hazardous Materials.

National Fire Protection Association publication #55, "Standard for the Storage, Use and Handling of Compressed and Liquified Gases in Portable Cylinders".

Compressed Gas Association publication P-1, "Safe Handling of Compressed Gases in Containers".

Store and handle in accordance with current regulations and standards:

OSHA 29 CFR 1910.101

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

CARBON DIOXIDE, GAS:

CARBON DIOXIDE:

5000 ppm (9000 mg/m3) OSHA TWA

10000 ppm (18000 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

30000 ppm (54000 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)

5000 ppm ACGIH TWA

30000 ppm ACGIH STEL

5000 ppm (9000 mg/m3) NIOSH recommended TWA 10 hour(s)

30000 ppm (54000 mg/m3) NIOSH recommended STEL

9100 mg/m3 (5000 ml/m3) DFG MAK (peak limitation category-IV)

9000 mg/m3 (5000 ml/m3) EC MAK

5000 ppm (9150 mg/m3) UK OES TWA

15000 ppm (27400 mg/m3) UK OES STEL

MEASUREMENT METHOD: Gas collection bag; Gas chromatography with thermal conductivity detection; NIOSH IV # 6603

VENTILATION: Based on available information, additional ventilation is not required. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Eye protection not required, but recommended.
CLOTHING: For the gas: Protective clothing is not required. For the liquid:
Wear appropriate protective, cold insulating clothing.
GLOVES: Protective gloves are not required, but recommended.
RESPIRATOR: The following respirators and maximum use concentrations are drawn
from NIOSH and/or OSHA.
40,000 ppm
Any supplied-air respirator.
Any self-contained breathing apparatus with a full facepiece.
Escape -
Any appropriate escape-type, self-contained breathing apparatus.
For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a
pressure-demand or other positive-pressure mode in combination with a
separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

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SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION: Colorless, odorless gas, with a slight acidic taste.
MOLECULAR WEIGHT: 44.01
MOLECULAR FORMULA: C-O2
BOILING POINT: Not available
FREEZING POINT: -71 F (-57 C) @ 4000 mmHg
SUBLIMATION POINT: -110 F (-79 C)
VAPOR PRESSURE: 43700 mmHg @ 21 C
VAPOR DENSITY (air=1): 1.5
SPECIFIC GRAVITY (water=1): 1.522 @ 21 C
WATER SOLUBILITY: soluble
PH: acidic in solution
VOLATILITY: Not applicable
ODOR THRESHOLD: Not available
EVAPORATION RATE: Not applicable
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable
SOLVENT SOLUBILITY:
Soluble: alcohol, acetone, hydrocarbons, organic solvents

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.
CONDITIONS TO AVOID: Protect from physical damage and heat. Containers may
rupture or explode if exposed to heat. Avoid contact with water or moisture.
INCOMPATIBILITIES: combustible materials, oxidizing materials, metal salts,
reducing agents, metal carbide, metals, bases
CARBON DIOXIDE:
ACRYLALDEHYDE: Exothermic polymerization.
BARIUM PEROXIDE: Incandescent reaction.
CESIUM OXIDE: Ignition.
DIETHYL MAGNESIUM: Ignition.
ETHYLENEIMINE: Explosive polymerization.
HYDRAZINE: Decomposition.
METAL ACETYLIDES: Ignition or incandescence.
METAL HYDRIDES: Reduction reaction.
METALS: Dusts of many metals suspended in carbon dioxide atmospheres are
ignitable and explosive; some bulk metals will burn in the gas at elevated
temperatures.
POTASSIUM: Mixtures of the solids are impact-sensitive.
POTASSIUM-SODIUM ALLOY: Mixtures of the solids are impact-sensitive.
SODIUM: Mixtures of the solids are impact-sensitive.
SODIUM PEROXIDE: Highly exothermic reaction; may be explosive in the

presence of metals.

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POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

CARBON DIOXIDE, GAS:

TOXICITY DATA:

9 pph/5 minute(s) inhalation-human LCLo; 90000 ppm/5 minute(s)
inhalation-mammal LCLo; 10000 ppm/24 hour(s)-30 day(s) continuous
inhalation-rat TCLo; 27000 ppm/24 hour(s)-30 day(s) continuous
inhalation-rabbit TCLo

ACUTE TOXICITY LEVEL: Insufficient Data.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: heart or cardiovascular disorders,
respiratory disorders

REPRODUCTIVE EFFECTS DATA:

6 pph inhalation-rat TCLo/24 hour(s) 10 day(s) pregnant female continuous; 6
pph inhalation-rat TCLo/24 hour(s) 10 day(s) pregnant female continuous; 55
pph inhalation-mouse TCLo/2 hour(s) 3 day(s) male; 55 pph inhalation-mouse
TCLo/4 hour(s) 6 day(s) male; 2 pph inhalation-mouse TCLo/8 hour(s) 10
day(s) pregnant female continuous; 13 pph inhalation-rabbit TCLo/4 hour(s)
9-12 day(s) pregnant female continuous

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

CARBON DIOXIDE: In the solid or liquid form carbon dioxide is very
volatile, readily releasing the gas. At concentrations from 2-10% it may
cause acidic taste, dyspnea, headache, vertigo, nausea, labored breathing,
weakness, drowsiness, mental confusion, and increase in blood pressure,
pulse, and respiratory rate. Exposure to 10% for a few minutes has been
reported to cause visual disturbances, tinnitus, tremors, profuse
perspiration, restlessness, paresthesias, general feeling of discomfort,
loss of consciousness, and coma. Concentrations of 25-30% may cause coma
and convulsions within one minute. Tachycardia and arrhythmias are
possible. Concentrations of 50% may cause symptoms of hypocalcemia
including carpopedal spasms. Excessive carbon dioxide for a time period of
not more than 5 minutes was reported to cause effects on vision with
constriction of visual fields, enlargement of blind spots, photophobia,
loss of convergence and accommodation, and deficient dark adaptation as
well as headache, insomnia, and personality changes, largely depression
and irritability. Even when there is sufficient oxygen present to prevent
simple asphyxiation by carbon dioxide, high concentrations may cause
adverse effects by interfering with its normal elimination from the body.
Initially, exposure to increased carbon dioxide concentrations results in
a compensatory increase in both rate and depth of ventilation. Beyond a
certain point, however, this may reverse to hypoventilation resulting in
respiratory acidosis. Death from asphyxia may occur if the concentration
and duration of exposure are sufficient. Reproductive effects have been
reported in animals.

CHRONIC EXPOSURE:

CARBON DIOXIDE: It has been reported that persons may tolerate 1.5% in
inhaled air for prolonged periods without adverse effects, but calcium/

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phosphorus metabolism may be affected with serum levels of calcium and
urinary phosphorus progressively falling. At 2% concentration, deepened
respiration may occur. At 3% impairment of performance has been noted. It
has, however, been demonstrated that the development of tolerance may
occur during prolonged exposure to low levels. Reproductive effects have
been reported in animals.

SKIN CONTACT:

ACUTE EXPOSURE:

CARBON DIOXIDE: No adverse effects have been reported from exposure to the gas. Due to rapid evaporation, the liquid or solid may cause frostbite with redness, tingling and pain or numbness. In more severe cases, the skin may become hard and white and develop blisters.

CHRONIC EXPOSURE:

CARBON DIOXIDE: No adverse effects are expected from exposure at low levels.

EYE CONTACT:

ACUTE EXPOSURE:

CARBON DIOXIDE: At high concentrations in air, carbon dioxide may cause a stinging sensation of the eyes. 200,000 ppm of the gas may cause irritation. Due to rapid evaporation, the liquid or solid may cause frostbite with redness, pain, and blurred vision.

CHRONIC EXPOSURE:

CARBON DIOXIDE: No adverse effects are expected from exposure to low levels.

INGESTION:

ACUTE EXPOSURE:

CARBON DIOXIDE: Ingestion of a gas is unlikely. If the liquid or solid is swallowed, frostbite damage to the lips, mouth and mucous membranes may occur.

CHRONIC EXPOSURE:

CARBON DIOXIDE: No data available.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY: 150000 ug/L 48 day(s) (Mortality) Brown trout (Salmo trutta)

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

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SECTION 14 TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Carbon dioxide

ID NUMBER: UN1013

HAZARD CLASS OR DIVISION: 2.2

LABELING REQUIREMENTS: Nonflammable gas

PACKAGING AUTHORIZATIONS:

EXCEPTIONS: 49 CFR 173.306

NON-BULK PACKAGING: 49 CFR 173.302, 304

BULK PACKAGING: 49 CFR 173.302, 314, 315

QUANTITY LIMITATIONS:

PASSENGER AIRCRAFT OR RAILCAR: 75 kg

CARGO AIRCRAFT ONLY: 150 kg

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR/RID:

SUBSTANCE NAME: Carbon dioxide

UN NUMBER: UN1013

ADR/RID CLASS: 2

ITEM NUMBER: 5(a)/2A

WARNING SIGN/LABEL: 2/2; 13

HAZARD ID NUMBER: 20

AIR TRANSPORT IATA/ICAO:

PROPER SHIPPING NAME: Carbon dioxide

UN/ID NUMBER: UN1013

IATA/ICAO CLASS: 2.2

LABEL: Nonflammable gas

MARITIME TRANSPORT IMDG:

CORRECT TECHNICAL NAME: Carbon dioxide
UN/ID NUMBER: UN1013
IMDG CLASS: 2(2.2)
EmS No.: 2-09
MFAG Table No.: 615
IMDG CODE PAGE: 2111

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.
SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):
Not regulated.
SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):
Not regulated.
SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

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ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVE: No
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.
OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

EUROPEAN REGULATIONS:

EC CLASSIFICATION (CALCULATED): Not determined.

GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):
STATE OF CLASSIFICATION: VwVwS
CLASSIFICATION UNDER HAZARD TO WATER: 0

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.
TSCA 12(b) EXPORT NOTIFICATION: Not listed.

SECTION 16 OTHER INFORMATION

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