

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

GT&S, INC
(FORMERLY MG INDUSTRIES)
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ALLENTOWN, PENNSYLVANIA 18104
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EMERGENCY CONTACT:
CHEMTREC:
1-800-424-9300

SUBSTANCE: ARGOMIX 208, 218, 225

TRADE NAMES/SYNONYMS:

8-25% CARBON DIOXIDE IN ARGON; 8-25 MOLAR % CO₂ IN Ar; MGI00462

CREATION DATE: Jun 28 1990

REVISION DATE: Sep 13 2007

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: ARGON, COMPRESSED
CAS NUMBER: 7440-37-1
EC NUMBER (EINECS): 231-147-0
PERCENTAGE: 75.0-92.0

COMPONENT: CARBON DIOXIDE, GAS
CAS NUMBER: 124-38-9
EC NUMBER (EINECS): 204-696-9
PERCENTAGE: 8.0-25.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:

COLOR: colorless

PHYSICAL FORM: gas

ODOR: odorless

MAJOR HEALTH HAZARDS: difficulty breathing

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

POTENTIAL HEALTH EFFECTS:



INHALATION:

SHORT TERM EXPOSURE: sensitivity to light, changes in blood pressure, nausea, vomiting, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, sleep disturbances, emotional disturbances, mood swings, tingling sensation, tremors, muscle cramps, loss of coordination, visual disturbances, suffocation, convulsions, unconsciousness, coma

LONG TERM EXPOSURE: difficulty breathing, disorientation, blood disorders

SKIN CONTACT:

SHORT TERM EXPOSURE: blisters, frostbite

LONG TERM EXPOSURE: no information on significant adverse effects

EYE CONTACT:

SHORT TERM EXPOSURE: frostbite

LONG TERM EXPOSURE: no information on significant adverse effects

INGESTION:

SHORT TERM EXPOSURE: ingestion of a gas is unlikely

LONG TERM EXPOSURE: ingestion of a gas is unlikely

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

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 for at least 15 minutes. Then get immediate medical attention.

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

NOTE TO PHYSICIAN: For inhalation, consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible explosion hazard. Containers may rupture or explode if exposed to heat.

EXTINGUISHING MEDIA: carbon dioxide, regular dry chemical

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. Do not get water directly on material. Avoid inhalation of material or combustion by-products.

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Stop leak if possible without personal risk. Small spills of the liquid component: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Spills with a large number of canisters: Dike for later disposal.

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. 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 Liquefied Gases in Portable Cylinders". Compressed Gas Association publication P-1, "Safe Handling of Compressed Gases in Containers". Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. See original container for storage recommendations. Keep separated from incompatible substances.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

ARGON, COMPRESSED:

ARGON:

ACGIH (simple asphyxiant)

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 - II, with excursion factor of 2)

9000 mg/m³ (5000 ppm) EC OEL TWA (IOELV)

5000 ppm (9150 mg/m³) UK WEL TWA

15000 ppm (27400 mg/m³) UK WEL STEL

MEASUREMENT METHOD: NIOSH IV # 6603; OSHA ID172

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

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

GLOVES: Wear insulated gloves.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas

COLOR: colorless

ODOR: odorless

BOILING POINT: Not available

FREEZING POINT: Not available

VAPOR PRESSURE: Not available

VAPOR DENSITY: Not available

SPECIFIC GRAVITY (water=1): >1.4

WATER SOLUBILITY: Not available

PH: Not applicable

VOLATILITY: Not applicable

ODOR THRESHOLD: Not available

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable

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.

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.

HAZARDOUS DECOMPOSITION:

Thermal decomposition products: oxides of carbon

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

CARBON DIOXIDE, GAS:

TOXICITY DATA: 9 pph/5 minute(s) inhalation-human LCLo; 90000 ppm/5 minute(s) inhalation-mammal LCLo; 20 pph inhalation-mouse TCLo; 21 pph/1 hour(s) inhalation-rat TCLo; 11 pph/2 hour(s) inhalation-mammal TCLo; 70 pph inhalation-mammal TCLo; 5 pph/5 hour(s) inhalation-rabbit TCLo; 3 pph/7 day(s) inhalation-rabbit TCLo; 5 pph inhalation-dog TCLo; 10 pph inhalation-dog TCLo; 11 pph inhalation-human LCLo; 0.25 pph inhalation-human TCLo; 2.5 pph inhalation-human TCLo; 7 pph inhalation-human TCLo; 0.1 pph/20 minute(s) inhalation-rabbit TCLo; 7 pph/20 minute(s) inhalation-human TCLo; 361 gm/m³/2 hour(s) inhalation-mouse LC50; 200000 ppm/2 hour(s) inhalation-mouse LC50; 470000 ppm/30 minute(s) inhalation-rat LC50; 10000 ppm/24 hour(s)-30 day(s) continuous inhalation-rat TCLo; 27000 ppm/24 hour(s)-30 day(s) continuous inhalation-rabbit TCLo; 4 pph/1 hour(s)-7 day(s) intermittent inhalation-dog TCLo

ACUTE TOXICITY LEVEL:

Relatively Non-toxic: inhalation

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; 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:

ARGON: See information on simple asphyxiants.

ACUTE EXPOSURE:

SIMPLE ASPHYXIANTS: The symptoms of asphyxia depend on the rapidity with which the oxygen deficiency develops and how long it continues. In sudden acute asphyxia, unconsciousness may be immediate. With slow development there may be rapid respiration and pulse, air hunger, dizziness, reduced awareness, tightness in the head, tingling sensations, incoordination, faulty judgement, emotional instability, and rapid fatigue. As the asphyxia progresses, nausea, vomiting, collapse, unconsciousness, convulsions, deep coma and death are possible.

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:

SIMPLE ASPHYXIANTS: No data available.

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

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

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, pain, or numbness. In more severe cases, the skin may become hard, white, and blistered.

CHRONIC EXPOSURE:

ARGON: No data available.

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

EYE CONTACT:**ACUTE EXPOSURE:**

ARGON: No adverse effects have been reported from the gas. Due to evaporation, the cryogenic liquid may cause frostbite with redness, pain, and blurred vision.

CARBON DIOXIDE: At high concentrations in air, carbon dioxide may cause a stinging sensation of the eyes. Exposure to 200,000 ppm (20%) 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:

ARGON: No data available.

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

INGESTION:**ACUTE EXPOSURE:**

ARGON: Ingestion of a gas is unlikely. If the cryogenic liquid is swallowed, frostbite damage to the lips, mouth and mucous membranes may occur.

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:

ARGON: No data available.

CARBON DIOXIDE: No data available.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Compressed gas, n.o.s. (CARBON DIOXIDE, GAS, ARGON, COMPRESSED)

ID NUMBER: UN1956

HAZARD CLASS OR DIVISION: 2.2

LABELING REQUIREMENTS: 2.2

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**

SHIPPING NAME: Compressed gas, n.o.s. (CARBON DIOXIDE, GAS, ARGON, COMPRESSED)
UN NUMBER: UN1956
CLASS: 2.2

LAND TRANSPORT ADR:
PROPER SHIPPING NAME: Compressed gas, n.o.s. (CARBON DIOXIDE, GAS, ARGON, COMPRESSED)
UN NUMBER: UN1956
CLASS: 2
CLASSIFICATION CODE: 1A
LABELS: 2.2

LAND TRANSPORT RID:
PROPER SHIPPING NAME: Compressed gas, n.o.s. (CARBON DIOXIDE, GAS, ARGON, COMPRESSED)
UN NUMBER: UN1956
CLASS: 2
CLASSIFICATION CODE: 1A
LABELS: 2.2; (+13)

AIR TRANSPORT IATA:
PROPER SHIPPING NAME: Compressed gas, n.o.s. (CARBON DIOXIDE, GAS, ARGON, COMPRESSED)
UN/ID NUMBER: UN1956
CLASS OR DIVISION: 2.2
HAZARD LABELS: 2.2

AIR TRANSPORT ICAO:
PROPER SHIPPING NAME: Compressed gas, n.o.s. (CARBON DIOXIDE, GAS, ARGON, COMPRESSED)
UN NUMBER: UN1956
CLASS OR DIVISION: 2.2
LABELS: 2.2

MARITIME TRANSPORT IMDG:
PROPER SHIPPING NAME: Compressed gas, n.o.s. (CARBON DIOXIDE, GAS, ARGON, COMPRESSED)
UN NUMBER: UN1956
CLASS OR DIVISION: 2.2

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):

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.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): All the components of this substance are listed on or are exempt from the inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

16. OTHER INFORMATION

MSDS SUMMARY OF CHANGES

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

11. TOXICOLOGICAL INFORMATION

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