

# MATERIAL SAFETY DATA SHEET

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## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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**MATHESON TRI-GAS, INC.**  
**150 Allen Road Suite 302**  
**Basking Ridge, New Jersey 07920**  
**Information: 1-800-416-2505**

**Emergency Contact:**  
**CHEMTREC 1-800-424-9300**  
**Calls Originating Outside the US:**  
**703-527-3887 (Collect Calls Accepted)**

### **SUBSTANCE: CARBON MONOXIDE**

#### **TRADE NAMES/SYNONYMS:**

MTG MSDS 18; CARBON OXIDE; CARBONIC OXIDE; CARBON OXIDE (CO); FLUE GAS; UN 1016; CO; MAT04290; RTECS FG3500000

**CHEMICAL FAMILY:** inorganic, gas

**PRODUCT USE:** industrial

**CREATION DATE:** Jan 24 1989

**REVISION DATE:** Dec 11 2008

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## 2. COMPOSITION, INFORMATION ON INGREDIENTS

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**COMPONENT:** CARBON MONOXIDE

**CAS NUMBER:** 630-08-0

**PERCENTAGE:** 100

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## 3. HAZARDS IDENTIFICATION

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**NFPA RATINGS (SCALE 0-4):** HEALTH=3 FIRE=4 REACTIVITY=0

#### **EMERGENCY OVERVIEW:**

**COLOR:** colorless

**PHYSICAL FORM:** gas

**ODOR:** odorless

**MAJOR HEALTH HAZARDS:** harmful if inhaled, blood damage, difficulty breathing

**PHYSICAL HAZARDS:** Flammable gas. May cause flash fire.

#### **POTENTIAL HEALTH EFFECTS:**

**INHALATION:**



**SHORT TERM EXPOSURE:** changes in body temperature, changes in blood pressure, nausea, vomiting, chest pain, difficulty breathing, irregular heartbeat, headache, drowsiness, fatigue, dizziness, disorientation, hallucinations, pain in extremities, tremors, loss of coordination, hearing loss, visual disturbances, eye damage, bluish skin color, suffocation, blood disorders, convulsions, coma

**LONG TERM EXPOSURE:** nausea, vomiting, loss of appetite, headache, dizziness, visual disturbances, blood disorders, heart disorders, heart damage, nerve damage, reproductive effects, birth defects, brain damage

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** blisters, frostbite

**LONG TERM EXPOSURE:** no information is available

**EYE CONTACT:**

**SHORT TERM EXPOSURE:** frostbite, blurred vision

**LONG TERM EXPOSURE:** no information is available

**INGESTION:**

**SHORT TERM EXPOSURE:** ingestion of a gas is unlikely

**LONG TERM EXPOSURE:** ingestion of a gas is unlikely

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## 4. FIRST AID MEASURES

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**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:** Contact with liquid: Immediately 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.

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## 5. FIRE FIGHTING MEASURES

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**FIRE AND EXPLOSION HAZARDS:** Severe fire hazard. Vapor/air mixtures are explosive. Containers may rupture or explode if exposed to heat.

**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 fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

**FIRE FIGHTING PROTECTIVE EQUIPMENT:** Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

**FLASH POINT:** Not available

**LOWER FLAMMABLE LIMIT:**  $\geq 12.5$  % by volume

**UPPER FLAMMABLE LIMIT:** 74 % by volume

**AUTOIGNITION:** 1292 F (700 C)

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## 6. ACCIDENTAL RELEASE MEASURES

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### **WATER RELEASE:**

Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

### **OCCUPATIONAL RELEASE:**

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition.

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## 7. HANDLING AND STORAGE

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**STORAGE:** Store in accordance with all current regulations and standards. Store in a cool, dry place. Store in a well-ventilated area. Avoid direct sunlight. Avoid heat, flames, sparks and other sources of ignition. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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### **EXPOSURE LIMITS:**

#### **CARBON MONOXIDE:**

50 ppm (55 mg/m<sup>3</sup>) OSHA TWA

35 ppm (40 mg/m<sup>3</sup>) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)

200 ppm (229 mg/m<sup>3</sup>) OSHA ceiling (vacated by 58 FR 35338, June 30, 1993)

25 ppm ACGIH TWA

35 ppm (40 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)

200 ppm (229 mg/m<sup>3</sup>) NIOSH recommended ceiling

**VENTILATION:** Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure 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:** The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

**350 ppm**

Any supplied-air respirator.

**875 ppm**

Any supplied-air respirator operated in a continuous-flow mode.

**1200 ppm**

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.

End of service life indicator required (ESLI).

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

Emergency or planned entry into unknown concentrations or IDLH conditions -

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

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.

**Escape -**

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.

End of service life indicator required (ESLI).

Any appropriate escape-type, self-contained breathing apparatus.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL STATE:** gas

**COLOR:** colorless

**ODOR:** odorless

**TASTE:** tasteless

**MOLECULAR WEIGHT:** 28.01

**MOLECULAR FORMULA:** C-O  
**BOILING POINT:** -312.7 F (-191.5 C)  
**FREEZING POINT:** -337 F (-205 C)  
**DECOMPOSITION POINT:** Not available  
**VAPOR PRESSURE:** 760 mmHg @ -191 C  
**VAPOR DENSITY (air=1):** 0.968  
**SPECIFIC GRAVITY:** Not applicable  
**DENSITY:** 1.250 g/L @ 0 C  
**WATER SOLUBILITY:** 2.3% @ 20 C  
**PH:** Not applicable  
**VOLATILITY:** Not applicable  
**ODOR THRESHOLD:** Not available  
**EVAPORATION RATE:** Not applicable  
**VISCOSITY:** 0.01657 cP @ 0 C  
**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not applicable  
**SOLVENT SOLUBILITY:**  
**Soluble:** alcohol, benzene, acetic acid, ethyl acetate, chloroform, cuprous chloride solutions

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:** Stable at normal temperatures and pressure.

**CONDITIONS TO AVOID:** Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

**INCOMPATIBILITIES:** oxidizing materials, halogens, metal oxides, metals, combustible materials, lithium

**HAZARDOUS DECOMPOSITION:**  
Thermal decomposition products: oxides of carbon

**POLYMERIZATION:** Will not polymerize.

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## 11. TOXICOLOGICAL INFORMATION

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**CARBON MONOXIDE:**  
**TOXICITY DATA:** 1807 ppm/4 hour(s) inhalation-rat LC50

**ACUTE TOXICITY LEVEL:**  
Toxic: inhalation

**TARGET ORGANS:** blood, heart, nervous system

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** blood system disorders, heart or cardiovascular disorders, hormonal disorders, respiratory disorders

**REPRODUCTIVE EFFECTS DATA:** Available.

**ADDITIONAL DATA:** Alcohol may enhance the toxic effects. May cross the placenta. Smoking may enhance the toxic effects.

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## 12. ECOLOGICAL INFORMATION

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**ECOTOXICITY DATA:**

**FISH TOXICITY:** 75000 ug/L 1 day(s) LC100 (Mortality) Orangespotted sunfish (*Lepomis humilis*)

**INVERTEBRATE TOXICITY:** No data available.

**ALGAL TOXICITY:** No data available.

**PHYTOTOXICITY:** Absorbed and metabolized by plants in varying rates dependent on ecological conditions.

**FATE AND TRANSPORT:**

**BIODEGRADATION:** Oxidation to carbon dioxide in aerobic conditions found to vary between bacteria species.

**ATMOSPHERIC PROCESSES:** Degraded by photochemical reactions in atmosphere.

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## 13. DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

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## 14. TRANSPORT INFORMATION

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**U.S. DOT 49 CFR 172.101:**

**PROPER SHIPPING NAME:** Carbon monoxide, compressed

**ID NUMBER:** UN1016

**HAZARD CLASS OR DIVISION:** 2.3

**LABELING REQUIREMENTS:** 2.3; 2.1

**QUANTITY LIMITATIONS:**

**PASSENGER AIRCRAFT OR RAILCAR:** Forbidden

**CARGO AIRCRAFT ONLY:** 25 kg

**ADDITIONAL SHIPPING DESCRIPTION:** Toxic-Inhalation Hazard Zone D



**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:**

**SHIPPING NAME:** Carbon monoxide, compressed

**UN NUMBER:** UN1016

**CLASS:** 2.3; 2.1

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## 15. REGULATORY INFORMATION

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### **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 Subpart B):** Not regulated.

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):** Not regulated.

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):**

ACUTE: Yes

CHRONIC: Yes

FIRE: Yes

REACTIVE: No

SUDDEN RELEASE: Yes

**SARA TITLE III SECTION 313 (40 CFR 372.65):** Not regulated.

**OSHA PROCESS SAFETY (29 CFR 1910.119):** Not regulated.

### **STATE REGULATIONS:**

**California Proposition 65:**

Known to the state of California to cause the following:

**Carbon monoxide**

Developmental toxicity (Jul 01, 1989)

### **CANADIAN REGULATIONS:**

**WHMIS CLASSIFICATION:** A, B1, D1A, D2A.

### **NATIONAL INVENTORY STATUS:**

**U.S. INVENTORY (TSCA):** Listed on inventory.

**TSCA 12(b) EXPORT NOTIFICATION:** Not listed.

**CANADA INVENTORY (DSL/NDL):** Listed on DSL.

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## 16. OTHER INFORMATION

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### **MSDS SUMMARY OF CHANGES**

15. REGULATORY INFORMATION

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