

# MATERIAL SAFETY DATA SHEET

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## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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**MATHESON TRI-GAS, INC.**  
**959 ROUTE 46 EAST**  
**PARSIPPANY, NEW JERSEY 07054-0624**

**EMERGENCY CONTACT:**  
**CHEMTREC 1-800-424-9300**  
**INFORMATION CONTACT:**  
**973-257-1100**

**SUBSTANCE: CARBON MONOXIDE**

**TRADE NAMES/SYNONYMS:**

MTG MSDS 18; CARBON OXIDE; CARBON OXIDE (CO); UN 1016; CO; MAT04290; RTECS FG350000

**CHEMICAL FAMILY:** inorganic, gas

**CREATION DATE:** Jan 24 1989

**REVISION DATE:** Dec 15 2003

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## 2. COMPOSITION, INFORMATION ON INGREDIENTS

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**COMPONENT:** CARBON MONOXIDE

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

**PERCENTAGE:** 100.0

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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:** blood damage, suffocation

**PHYSICAL HAZARDS:** Flammable gas. May cause flash fire. Flash back hazard.

**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, dizziness, disorientation, hallucinations, pain in extremities, tremors, loss of coordination, hearing loss, visual disturbances, eye damage,

suffocation, blood disorders, convulsions, coma

**LONG TERM EXPOSURE:** same as effects reported in short term exposure, loss of appetite, heart damage, nerve damage, birth defects, brain damage

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** no information on significant adverse effects

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

**EYE CONTACT:**

**SHORT TERM EXPOSURE:** no information on significant adverse effects

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

**INGESTION:**

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

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

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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:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

**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.

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## 5. FIRE FIGHTING MEASURES

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**FIRE AND EXPLOSION HAZARDS:** Severe explosion hazard. Vapor/air mixtures are explosive. Pressurized containers may rupture or explode if exposed to sufficient heat. Vapors or gases may ignite at distant ignition sources and flash back.

**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: 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: Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. 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. Stop flow of gas.

**LOWER FLAMMABLE LIMIT:** 12.0-12.5%

**UPPER FLAMMABLE LIMIT:** 74%

**AUTOIGNITION:** 1128-1202 F (609-650 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. Ventilate closed spaces before entering.

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## 7. HANDLING AND STORAGE

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**STORAGE:** Store and handle in accordance with all current regulations and standards. Grounding and bonding required. 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:** Eye protection not required, but recommended.

**CLOTHING:** Protective clothing is not required.

**GLOVES:** Wear appropriate chemical resistant 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 respirator with a full facepiece and a canister providing protection against this substance.

End of service life indicator required (ESLI).

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

**Escape -**

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

End of service life indicator required (ESLI).

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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## 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:** -314 F (-192 C)

**FREEZING POINT:** -326 F (-199 C)

**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

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

**MUTAGENIC DATA:** Available.

**REPRODUCTIVE EFFECTS DATA:** Available.

**ADDITIONAL DATA:** Alcohol 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*)

**FATE AND TRANSPORT:**

**KOW:** 1479.11 (log = 3.17) (estimated from water solubility)

**KOC:** 2760.58 (log = 3.44) (estimated from water solubility)

**HENRY'S LAW CONSTANT:** 1.2 E -3 atm-m<sup>3</sup>/mol

**BIOCONCENTRATION:** 2.13 (estimated from water solubility)

**AQUATIC PROCESSES:** 1.3766993 hours (River Model: 1 m deep, 1 m/s flow, 3 m/s wind)

**ENVIRONMENTAL SUMMARY:** Relatively non-persistent in the environment. Not expected to leach through the soil or the sediment. Accumulates very little in the bodies of living organisms. Highly volatile from water.

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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 355.30):** 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: Yes  
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:**

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/NDSL):** Listed on inventory.

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**16. OTHER INFORMATION**

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