

# MATERIAL SAFETY DATA SHEET

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## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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**GT&S, INC**  
**(FORMERLY MG INDUSTRIES)**  
**5275 TILGHMAN STREET**  
**ALLENTOWN, PENNSYLVANIA 18104**  
**PHONE: 610-398-2211**  
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**EMERGENCY CONTACT:**  
**CHEMTREC:**  
**1-800-424-9300**

**SUBSTANCE: ACETYLENE**

**TRADE NAMES/SYNONYMS:**

ETHYNE; WELDING GAS; ACETYLEN; ETHINE; NARCYLEN; VINYLENE; STCC 4905701; UN 1001; C<sub>2</sub>H<sub>2</sub>; MGI00280; RTECS AO9600000

**CHEMICAL FAMILY:** hydrocarbons, aliphatic

**CREATION DATE:** May 04 1990

**REVISION DATE:** Sep 13 2007

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## 2. COMPOSITION, INFORMATION ON INGREDIENTS

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**COMPONENT:** ACETYLENE  
**CAS NUMBER:** 74-86-2  
**EC NUMBER (EINECS):** 200-816-9  
**EC INDEX NUMBER:** 601-015-00-0  
**PERCENTAGE:** >99

**OTHER CONTAMINANTS:**

TRACES OF AIR, PHOSPHINE, ARSINE, HYDROGEN SULFIDE.

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## 3. HAZARDS IDENTIFICATION

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**NFPA RATINGS (SCALE 0-4):** HEALTH=1 FIRE=4 REACTIVITY=3

**EMERGENCY OVERVIEW:**

**PHYSICAL DESCRIPTION:** Colorless gas with ethereal odor when pure, garlic-like odor if impure.

**MAJOR HEALTH HAZARDS:** central nervous system depression, difficulty breathing

**PHYSICAL HAZARDS:** May explode when heated. Flammable gas. May cause flash fire.



**POTENTIAL HEALTH EFFECTS:****INHALATION:**

**SHORT TERM EXPOSURE:** nausea, vomiting, chest pain, wheezing, headache, symptoms of drunkenness, bluish skin color, suffocation, lung congestion, coma

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

**SKIN CONTACT:**

**SHORT TERM EXPOSURE:** rash

**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:** no information on significant adverse effects

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

**CARCINOGEN STATUS:**

**OSHA:** No

**NTP:** No

**IARC:** No

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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 exposed skin with soap and water.

**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.

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**5. FIRE FIGHTING MEASURES**

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**FIRE AND EXPLOSION HAZARDS:** Severe explosion hazard. Vapor/air mixtures are explosive. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

**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. 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: Stop leak if possible without personal risk. 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). Stop flow of gas.

**LOWER FLAMMABLE LIMIT:** 2.5%

**UPPER FLAMMABLE LIMIT:** 100%

**AUTOIGNITION:** 581 F (305 C)

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## 6. ACCIDENTAL RELEASE MEASURES

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### **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 current regulations and standards:

OSHA 29 CFR 1910.102. Protect from physical damage. Store outside or in a

detached building. Keep separated from incompatible substances. Store in

a cool, dry place. Ventilation required. Avoid heat, flames, sparks and other sources of ignition. Secure to prevent tipping.

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".

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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### **EXPOSURE LIMITS:**

#### **ACETYLENE:**

ACGIH (simple asphyxiant)

2500 ppm (2662 mg/m<sup>3</sup>) NIOSH recommended ceiling

**MEASUREMENT METHOD:** NIOSH Acetylene Criteria Document

**VENTILATION:** Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Eye protection not required, but recommended.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Protective gloves are not required, but recommended.

**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.

Any supplied-air respirator with a full facepiece that is operated in a 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.

**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.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL DESCRIPTION:** Colorless gas with ethereal odor when pure, garlic-like odor if impure.

**MOLECULAR WEIGHT:** 26.04

**MOLECULAR FORMULA:** H-C-C-H

**BOILING POINT:** Not available

**FREEZING POINT:** Not available

**SUBLIMATION POINT:** -119 F (-84 C)

**VAPOR PRESSURE:** 760 mmHg @ -84 C

**VAPOR DENSITY (air=1):** 0.90

**SPECIFIC GRAVITY:** Not applicable

**DENSITY:** 1.1747 g/L @ 0 C

**WATER SOLUBILITY:** 0.94% @ 25 C

**PH:** Not applicable

**VOLATILITY:** Not applicable

**ODOR THRESHOLD:** Not available

**EVAPORATION RATE:** Not applicable

**VISCOSITY:** 0.010 cP @ 20 C

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not applicable

**SOLVENT SOLUBILITY:**

**Soluble:** acetone, benzene, chloroform, ether

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:** May decompose violently on heating. May explode when heated.

**CONDITIONS TO AVOID:** Avoid heat, flames, sparks and other sources of ignition. Containers may

rupture or explode if exposed to heat.

**INCOMPATIBILITIES:** metals, halogens, oxidizing materials, metal carbide, reducing agents, halo carbons

**ACETYLENE:**

**BRASS:** Forms explosive acetylides.

**BROMINE:** Explosive reaction.

**CALCIUM HYPOCHLORITE:** May form explosive chloroacetylides.

**CESIUM HYDRIDE:** Vigorous reaction in the presence of moisture or above 42 C.

**CHLORINE:** Explosive reaction.

**COBALT:** Incandescent decomposition reaction.

**COPPER + SALTS:** Forms explosive acetylides.

**CUPROUS CARBIDE:** Explodes if preheated.

**FLUORINE:** Violent reaction.

**IODINE:** Explosive reaction.

**MERCURIC NITRATE:** Forms shock-sensitive acetylide.

**MERCURY + SALTS:** Forms explosive acetylides.

**NITRIC ACID (CONCENTRATED):** Forms explosive trinitromethane.

**NITROGEN OXIDE:** May ignite above 30 C.

**OXIDIZERS:** Violent or explosive reaction.

**OXYGEN:** Dangerous explosive reaction.

**OZONE:** May violently explode.

**POTASSIUM (MOLTEN):** Ignites, then explodes.

**RUBIDIUM HYDRIDE:** Vigorous reaction in the presence of moisture.

**SILVER + SALTS:** Forms explosive acetylides.

**SILVER NITRATE:** Forms explosive acetylide in ammonia solutions.

**SODIUM HYDRIDE:** Vigorous reaction in the presence of moisture.

**TRIFLUOROMETHYL HYPOFLUORITE:** Explosive reaction.

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products: oxides of carbon

**POLYMERIZATION:** Polymerizes with evolution of heat. Avoid contact with curing agents, accelerators, and/or initiators.

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## 11. TOXICOLOGICAL INFORMATION

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**ACETYLENE:**

**TOXICITY DATA:** 20 pph inhalation-human TClO; 50 pph/5 minute(s) inhalation-human LClO; 50 pph/5 minute(s) inhalation-mammal LClO

**TARGET ORGANS:** central nervous system

**ADDITIONAL DATA:** Stimulants such as epinephrine may induce ventricular fibrillation.

**HEALTH EFFECTS:**

**INHALATION:**

**ACUTE EXPOSURE:**

**ACETYLENE:** Pure acetylene at a level of 2.5% in air is reported to be nontoxic. Slight intoxication with reversible narcosis may occur at 10%; marked intoxication with dyspnea, headache, and staggering gait at 20%; loss of coordination at 30%; and loss of consciousness at 33-35% for 5-7 minutes. Complete anesthesia, increased blood pressure, narcosis, and stimulated respiration may occur at concentrations up to 80%. Other reported effects may include mild gastric symptoms, dizziness, mental confusion, emotional instability, hypercapnia, and myocardial sensitization. Asphyxiation may occur by reducing the oxygen concentration in respirable air to low levels. Commercial acetylene often contains impurities which may be responsible for symptoms before the asphyxiant level is reached. Symptoms may include rapid respiration, air hunger, impaired mental alertness, cyanosis, weak and irregular pulse, rapid fatigue, nausea, vomiting, prostration, metabolic acidosis, hyperglycemia, ketonuria, elevated creatinine levels, impairment of judgement and sensation, pulmonary edema, loss of consciousness, coma, and death. A worker who inhaled acetylene gas from a leaking torch developed severe respiratory distress, including diaphragmatic breathing, rhonchi and wheezing, and chest pain. Examination revealed extensive pulmonary edema, bronchopneumonia, and pleural effusion in both lungs. Symptoms were thought to be due to impurities.

**CHRONIC EXPOSURE:**

**ACETYLENE:** Exposure during the manufacture of acetylene from calcium carbide produced bronchitis and a stomach ulcer in a worker. Symptoms are believed to have originated from chronic phosphine poisoning. Intermittent exposure for 93 hours to 25% pure acetylene caused slight capillary hyperemia in experimental animals.

**SKIN CONTACT:**

**ACUTE EXPOSURE:**

**ACETYLENE:** No adverse effects have been reported from the pure gas. One case of urticaria has been reported following the use of an oxyacetylene torch in welding. It subsided within 6 hours after cessation of work. Symptoms were believed to result from impurities or combustion products in the gas.

**CHRONIC EXPOSURE:**

**ACETYLENE:** No data available.

**EYE CONTACT:**

**ACUTE EXPOSURE:**

**ACETYLENE:** No adverse effects have been reported from the gas.

**CHRONIC EXPOSURE:**

**ACETYLENE:** No data available.

**INGESTION:**

**ACUTE EXPOSURE:**

**ACETYLENE:** Ingestion of a gas is not likely.

**CHRONIC EXPOSURE:**

**ACETYLENE:** No data available.

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## 12. ECOLOGICAL INFORMATION

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Not available

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## 13. DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations.

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## 14. TRANSPORT INFORMATION

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

**PROPER SHIPPING NAME:** Acetylene, dissolved

**ID NUMBER:** UN1001

**HAZARD CLASS OR DIVISION:** 2.1

**LABELING REQUIREMENTS:** 2.1

**QUANTITY LIMITATIONS:**

**PASSENGER AIRCRAFT OR RAILCAR:** Forbidden

**CARGO AIRCRAFT ONLY:** 15 kg



### CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

**SHIPPING NAME:** Acetylene, dissolved

**UN NUMBER:** UN1001

**CLASS:** 2.1

### LAND TRANSPORT ADR:

**PROPER SHIPPING NAME:** Acetylene, dissolved

**UN NUMBER:** UN1001

**CLASS:** 2

**CLASSIFICATION CODE:** 4F

**LABELS:** 2.1

### LAND TRANSPORT RID:

**PROPER SHIPPING NAME:** Acetylene, dissolved

**UN NUMBER:** UN1001

**CLASS:** 2

**CLASSIFICATION CODE:** 4F

**LABELS:** 2.1; (+13)

### AIR TRANSPORT IATA:

**PROPER SHIPPING NAME:** Acetylene, dissolved

**UN/ID NUMBER:** UN1001

**CLASS OR DIVISION:** 2.1

**HAZARD LABELS:** 2.1

### AIR TRANSPORT ICAO:

**PROPER SHIPPING NAME:** Acetylene, dissolved

**UN NUMBER:** UN1001

**CLASS OR DIVISION:** 2.1

**LABELS:** 2.1

**MARITIME TRANSPORT IMDG:**  
**PROPER SHIPPING NAME:** Acetylene, dissolved  
**UN NUMBER:** UN1001  
**CLASS OR DIVISION:** 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: Yes

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 (ASSIGNED):**

F+	Extremely Flammable
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EC Classification may be inconsistent with independently-researched data.

### **DANGER/HAZARD SYMBOL:**



**F+**

### **EC RISK AND SAFETY PHRASES:**

R 5	Heating may cause an explosion.
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R 6	Explosive with or without contact with air.
R 12	Extremely flammable.
S 2	Keep out of the reach of children.
S 9	Keep container in a well-ventilated place.
S 16	Keep away from sources of ignition - No smoking.
S 33	Take precautionary measures against static discharges.

**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.

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**16. OTHER INFORMATION**

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**MSDS SUMMARY OF CHANGES**

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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