

MG INDUSTRIES  
3 GREAT VALLEY PARKWAY  
MALVERN, PENNSYLVANIA 19355

EMERGENCY CONTACT:  
CHEMTREC  
1-800-424-9300

SUBSTANCE IDENTIFICATION

SUBSTANCE: ACETYLENE CAS-NUMBER 74-86-2  
TRADE NAMES/SYNONYMS:  
ETHYNE; WELDING GAS; ACETYLEN; ETHINE; NARCYLEN; VINYLENE; STCC 4905701;  
UN 1001; C2H2; MGIO0280  
CHEMICAL FAMILY:  
HYDROCARBON, ALIPHATIC  
MOLECULAR FORMULA: H-C-C-H  
MOLECULAR WEIGHT: 26.04  
CERCLA RATINGS (SCALE 0-3): HEALTH=1 FIRE=3 REACTIVITY=3 PERSISTENCE=0  
NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=4 REACTIVITY=3

COMPONENTS AND CONTAMINANTS

COMPONENT: ACETYLENE PERCENT: >99  
CAS= 74-86-2  
OTHER CONTAMINANTS: TRACES OF AIR, PHOSPHINE, ARSINE,  
HYDROGEN SULFIDE.  
EXPOSURE LIMITS:  
ACETYLENE:  
2500 PPM (2662 MG/M3) NIOSH RECOMMENDED CEILING

PHYSICAL DATA

DESCRIPTION: COLORLESS GAS WITH ETHEREAL ODOR WHEN PURE, GARLIC-LIKE ODOR IF  
IMPURE. MELTING POINT: -119 F (-84 C) (SUBLIMES)  
SPECIFIC GRAVITY: 1.1747 G/L @ 0 C VAPOR PRESSURE: 760 MMHG @ -84 C  
SOLUBILITY IN WATER: 0.94% @ 25 C VAPOR DENSITY: 0.90  
SOLVENT SOLUBILITY: SOLUBLE IN ACETONE, BENZENE, CHLOROFORM, ETHER.  
VISCOSITY: 0.010 CPS @ 20 C (GAS)  
DENSITY: 0.610 @ -81 C

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:  
DANGEROUS EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME.  
VAPOR-AIR MIXTURES ARE EXPLOSIVE.  
DUE TO LOW ELECTROCONDUCTIVITY OF THE SUBSTANCE, FLOW OR AGITATION MAY  
GENERATE ELECTROSTATIC CHARGES RESULTING IN SPARKS WITH POSSIBLE IGNITION.  
UPPER EXPLOSIVE LIMIT: 100% LOWER EXPLOSIVE LIMIT: 2.5%  
AUTOIGNITION TEMP.: 581 F (305 C)  
FIREFIGHTING MEDIA:  
DRY CHEMICAL OR CARBON DIOXIDE  
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).  
FOR LARGER FIRES, USE WATER SPRAY, FOG OR REGULAR FOAM  
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).  
FIREFIGHTING:  
MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. FOR MASSIVE FIRE  
IN CARGO AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES; IF THIS IS  
IMPOSSIBLE, WITHDRAW FROM AREA AND LET FIRE BURN WITHDRAW IMMEDIATELY IN CASE  
OF RISING SOUND FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF TANK DUE TO  
FIRE. COOL CONTAINER WITH WATER USING UNMANNED DEVICE UNTIL WELL AFTER FIRE IS  
OUT. LEFT TANK, TANK CAR OR TANK TRUCK BURN UNLESS LEAK CAN BE STOPPED; WITH  
SMALLER TANKS OR CYLINDERS, EXTINGUISH/ISOLATE FROM OTHER FLAMMABLES. ISOLATE  
FOR 1/2 MILE IN ALL DIRECTIONS IF TANK, RAIL CAR OR TANK TRUCK IS INVOLVED IN  
FIRE (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5, GUIDE PAGE 17).  
EXTINGUISH ONLY IF FLOW CAN BE STOPPED; USE WATER IN FLOODING AMOUNTS AS A  
FOG. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER. AVOID BREATHING TOXIC  
VAPORS. KEEP UPWIND. EVACUATE TO A RADIUS OF 1500 FEET FOR UNCONTROLLABLE  
FIRES. CONSIDER EVACUATION OF DOWNWIND AREA IF MATERIAL IS LEAKING.  
STOP FLOW OF GAS (NFPA 325M, FIRE HAZARD PROPERTIES OF FLAMMABLE LIQUIDS,  
GASES, AND VOLATILE SOLIDS, 1991).

TRANSPORTATION DATA

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49-CFR 172.101:  
FLAMMABLE GAS  
DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49-CFR 172.101 AND  
SUBPART E:  
FLAMMABLE GAS  
DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: 49-CFR 173.303  
EXCEPTIONS: NONE  
FINAL RULE ON HAZARDOUS MATERIALS REGULATIONS (HMR, 49 CFR PARTS 171-180),  
DOCKET NUMBERS HM-181, HM-181A, HM-181B, HM-181C, HM-181D AND HM-204,  
EFFECTIVE DATE OCTOBER 1, 1991. HOWEVER, COMPLIANCE WITH THE REGULATIONS IS  
AUTHORIZED ON AND AFTER JANUARY 1, 1991. (55 FR 52402, 12/21/90)

EXCEPT FOR EXPLOSIVES, INHALATION HAZARDS, AND INFECTIOUS SUBSTANCES, THE EFFECTIVE DATE FOR HAZARD COMMUNICATION REQUIREMENTS IS EXTENDED TO OCTOBER 1, 1993. (56 FR 47158, 09/18/91)

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101: ACETYLENE, DISSOLVED-UN 1001

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101: 2.1 - FLAMMABLE GAS

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101 AND SUBPART E: FLAMMABLE GAS

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS: EXCEPTIONS: NONE  
NON-BULK PACKAGING: 49 CFR 173.303  
BULK PACKAGING: NONE

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101: PASSENGER AIRCRAFT OR RAILCAR: FORBIDDEN  
CARGO AIRCRAFT ONLY: 15 KG

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TOXICITY

ACETYLENE:  
TOXICITY DATA: 20 PPH INHALATION-HUMAN LCLO; 50 PPH/5 MINUTES INHALATION-HUMAN LCLO; 50 PPH/5 MINUTES INHALATION-MAMMAL LCLO.  
CARCINOGEN STATUS: NONE  
ACUTE TOXICITY LEVEL: INSUFFICIENT DATA  
TARGET EFFECTS: SIMPLE ASPHYXIAN; CENTRAL NERVOUS SYSTEM DEPRESSANT.  
ADDITIONAL DATA: STIMULANTS SUCH AS EPINEPHRINE OR EPHEDRINE MAY INDUCE VENTRICULAR FIBRILLATION.

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HEALTH EFFECTS AND FIRST AID

INHALATION:  
ACETYLENE:  
SIMPLE ASPHYXIAN/NARCOTIC.  
ACUTE EXPOSURE- 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 ASPHYXIAN 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.

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COMA, AND DEATH. A WORKER WHO INHALED ACETYLENE GAS FROM A LEAKING TORCH DEVELOPED SEVERE RESPIRATORY DISTRESS, INCLUDING DIAPHRAGMATIC BREATHING, RHONCH, 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- 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.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND BLOOD PRESSURE AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ADMINISTRATION OF OXYGEN SHOULD BE PERFORMED BY QUALIFIED PERSONNEL. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:  
ACETYLENE:  
ACUTE EXPOSURE- 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- NO DATA AVAILABLE.

FIRST AID- IT IS UNLIKELY THAT EMERGENCY TREATMENT WILL BE REQUIRED. IF ADVERSE EFFECTS OCCUR, WASH WITH LARGE AMOUNTS OF WATER AND MILD SOAP AND GET MEDICAL ATTENTION.

EYE CONTACT:  
ACETYLENE:  
ACUTE EXPOSURE- NO ADVERSE EFFECTS HAVE BEEN REPORTED FROM THE GAS.  
CHRONIC EXPOSURE- NO DATA AVAILABLE.

FIRST AID- IT IS UNLIKELY THAT EMERGENCY TREATMENT WILL BE REQUIRED. IF ADVERSE EFFECTS OCCUR, WASH WITH WATER OR NORMAL SALINE AND GET MEDICAL ATTENTION.

INGESTION:  
ACETYLENE:  
ACUTE EXPOSURE- INGESTION OF A GAS IS NOT LIKELY.  
CHRONIC EXPOSURE- NO DATA AVAILABLE.

FIRST AID- IT IS UNLIKELY THAT EMERGENCY TREATMENT WILL BE REQUIRED. IF ADVERSE EFFECTS OCCUR, TREAT SYMPTOMATICALLY AND SUPPORTIVELY AND GET MEDICAL ATTENTION.

ANTIDOTE:  
NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

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REACTIVITY

REACTIVITY:  
MAY DECOMPOSE EXPLOSIVELY AT ELEVATED TEMPERATURES AND PRESSURES.

## INCOMPATIBILITIES:

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 AND SALTS: FORMS EXPLOSIVE ACETYLIDES.  
 CUPROUS CARBIDE: EXPLODES IF PREHEATED.  
 FLUORINE: VIOLENT REACTION.  
 IODINE: EXPLOSIVE REACTION.  
 MERCURIC NITRATE: FORMS SHOCK-SENSITIVE ACETYLIDE.  
 MERCURY AND 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 AND 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.

## DECOMPOSITION:

THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF CARBON.

## POLYMERIZATION:

MAY POLYMERIZE EXOTHERMICALLY ON CONTACT WITH APPROPRIATE CATALYSTS.

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STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

## \*\*STORAGE\*\*

STORE IN ACCORDANCE WITH 29 CFR 1910.102.

PROTECT AGAINST PHYSICAL DAMAGE. OUTSIDE OR DETACHED STORAGE IS PREFERRED. ISOLATE FROM OXIDIZING GASES. ESPECIALLY CHLORINE. STORE IN COOL, WELL-VENTILATED, NONCOMBUSTIBLE PLACE AWAY FROM ALL POSSIBLE SOURCES OF IGNITION AND COMBUSTIBLE MATERIALS. PROTECT AGAINST LIGHTNING AND STATIC ELECTRICITY. STORE CYLINDERS UPRIGHT (NFPA 49, HAZARDOUS CHEMICALS DATA, 1975)

BONDING AND GROUNDING: SUBSTANCES WITH LOW ELECTROCONDUCTIVITY, WHICH MAY BE IGNITED BY ELECTROSTATIC SPARKS, SHOULD BE STORED IN CONTAINERS WHICH MEET THE BONDING AND GROUNDING GUIDELINES SPECIFIED IN NFPA 77-1983, RECOMMENDED PRACTICE ON STATIC ELECTRICITY.

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

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CONDITIONS TO AVOID

MATERIAL IS EXTREMELY FLAMMABLE; AVOID CONTACT WITH HEAT, SPARKS, FLAMES OR OTHER SOURCES OF IGNITION. CONTENTS ARE UNDER PRESSURE; CONTAINERS MAY RUPTURE VIOLENTLY AND TRAVEL A CONSIDERABLE DISTANCE.

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SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:  
 SHUT OFF IGNITION SOURCES. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. ISOLATE AREA UNTIL GAS HAS DISPERSED. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA! KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY. VENTILATE CLOSED SPACES BEFORE ENTERING.

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PROTECTIVE EQUIPMENT

## VENTILATION:

PROVIDE LOCAL EXHAUST OR GENERAL DILUTION VENTILATION. VENTILATION EQUIPMENT MUST BE EXPLOSION-PROOF.

## RESPIRATOR:

THE FOLLOWING RESPIRATORS ARE RECOMMENDED BASED ON INFORMATION FOUND IN THE PHYSICAL DATA, TOXICITY AND HEALTH EFFECTS SECTIONS. THEY ARE RANKED IN ORDER FROM MINIMUM TO MAXIMUM RESPIRATORY PROTECTION. THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE. MUST BE BASED ON THE SPECIFIC OPERATION. MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND MUST BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

ANY TYPE 'C' SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE OR WITH A FULL FACEPIECE, HELMET OR HOOD OPERATED IN CONTINUOUS-FLOW MODE.

ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH 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 THAT HAS A FULL FACEPIECE AND 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.

## CLOTHING:

IMPERVIOUS CLOTHING IS NOT REQUIRED.

## GLOVES:

PROTECTIVE GLOVES ARE NOT REQUIRED BUT RECOMMENDED.

EYE PROTECTION:  
EYE PROTECTION NOT REQUIRED, BUT ADVISABLE.

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-ADDITIONAL INFORMATION-  
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