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MATERIAL SAFETY DATA SHEET

No. 1

PRODUCT NAME Acetylene	CAS # 74-86-2
TRADE NAME AND SYNONYMS Acetylene, Dissolved (D.O.T.)	DOT I.D. No.: UN 1001
	DOT Hazard Class: Division 2.1
CHEMICAL NAME AND SYNONYMS Acetylene, Ethyne	Formula C ₂ H ₂
	Chemical Family: Alkyne
ISSUE DATES AND REVISIONS Revised May 1998	

HEALTH HAZARD DATA

<p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT Acetylene is defined as a simple asphyxiant.(ACGIH 1997). No PEL (8 Hr. TWA) is listed by OSHA (1995). (Continued on Page 4)</p>
<p>SYMPTOMS OF EXPOSURE <u>Inhalation:</u> Low concentrations (10-20% in air) cause symptoms similar to that of being intoxicated. Higher concentrations so as to exclude an adequate supply of oxygen to the lungs cause unconsciousness.</p>
<p>TOXICOLOGICAL PROPERTIES As a narcotic gas or intoxicant causes hypercapnia (an excessive amount of carbon dioxide in the blood). Repeated exposures to tolerable levels have not shown deleterious effects. The major property is the exclusion of an adequate supply of oxygen to the lungs. Acetylene is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen. Persons in ill health where such illness would be aggravated by exposure to acetylene should not be allowed to work with or handle this product.</p>
<p>RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO ACETYLENE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD. Inhalation: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive. (Continued on Page 4)</p>

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.
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ACETYLENE

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Flammable over an extremely wide range in air. Explosive reactions may occur on ignition. Reacts explosively with halogens and halogenated compounds.

PHYSICAL DATA

BOILING POINT Sublimation point = -118.8°F (-83.8°C)	LIQUID DENSITY AT BOILING POINT @ -116°F (-82°C) = 38.8 lb/ft ³ (622 kg/m ³)
VAPOR PRESSURE @ 70°F (21.1°C) = 645 psia (4450 kPa)	GAS DENSITY AT 70°F, 1 atm .0691 lb/ft ³ (1.107 kg/m ³)
SOLUBILITY IN WATER Soluble	FREEZING POINT -113°F (-80.6°C)
EVAPORATION RATE N/A, dissolved gas	SPECIFIC GRAVITY (AIR=1) @ 68°F (20°C) = 0.906
APPEARANCE AND ODOR Pure-acetylene is a colorless gas with an ethereal odor. Commercial (carbide) acetylene has a distinctive garlic-like odor.	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) Gas	AUTO IGNITION TEMPERATURE 565°F (296°C)	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LEL 2.2 UEL 80-85
EXTINGUISHING MEDIA Carbon dioxide, dry chemical	ELECTRICAL CLASSIFICATION Class 1, Group A	
SPECIAL FIRE FIGHTING PROCEDURES If possible, stop flow of escaping gas. Use water spray to cool surrounding containers. Keep personnel away since heated or burning cylinders can rupture violently.		
UNUSUAL FIRE AND EXPLOSION HAZARDS GASEOUS ACETYLENE IS SPONTANEOUSLY COFIBUSTIBLE IN AIR AT PRESSURES ABOVE 30 PSIA (207 kPa). It requires a very low ignition energy so that fires which have been (Continued on Page 4)		

REACTIVITY DATA

STABILITY Unstable	X	CONDITIONS TO AVOID Do not allow the free gas (outside of cylinder) to exceed 30 psia. Cylinders should not be exposed to sudden shock or sources of heat.
Stable		
INCOMPATIBILITY (Materials to avoid) Oxygen and other oxidizers including all of the halogens and halo-ten compounds. (Continued on Page 4)		
HAZARDOUS DECOMPOSITION PRODUCTS Carbon and hydrogen		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID None
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.
WASTE DISPOSAL METHOD Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

ACETYLENE

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Positive pressure air line with mask or self-contained breathing apparatus should be		
VENTILATION Hood with forced ventilation	LOCAL EXHAUST To prevent accumulation above the LEL	SPECIAL N/A
	MECHANICAL (Gen.) In accordance with electrical codes	OTHER N/A
PROTECTIVE GLOVES PVC or rubber in laboratory; as required for cutting and welding		
EYE PROTECTION Safety goggles or glasses		
OTHER PROTECTIVE EQUIPMENT Safety shoes, safety shower		

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION DOT Shipping Name: Acetylene, dissolved DOT Hazard Class: Division 2.1 DOT Shipping Label: Flammable Gas I.D. No.: UN 1001
SPECIAL HANDLING RECOMMENDATIONS Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when removing gas from the cylinder. DO NOT ALLOW THE FREE GAS TO EXCEED 30 PSIA (207 kPa) @ 70°F (21.1°C). Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. For additional recommendations, consult Compressed Gas Association's Pamphlets G-1, P-1, P-14, and Safety Bulletin SB-2.
SPECIAL STORAGE RECOMMENDATIONS Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125F (52C). Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area. For additional recommendations, consult Compressed Gas Association's Pamphlets, G-1, P-1, P-14, and Safety Bulletin SB-2.
SPECIAL PACKAGING RECOMMENDATIONS Since acetylene will explode or combust if its pressure exceeds 30 psia (207 kPa) it is shipped dissolved in acetone or dimethylformamide which is dispersed in a porous mass within the cylinder. Follow your supplier's instructions for the maximum withdrawal rate for each size cylinder so that solvent is not withdrawn with the acetylene. Most metals except silver, copper, mercury or brasses with more than 66% copper are compatible (noncorrosive) with acetylene.
OTHER RECOMMENDATIONS OR PRECAUTIONS Earth-ground and bond all lines and equipment associated with the acetylene system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR). (Continued on Page 4)

*Various Government Agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

ACETYLENE

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT: (Continued)

Acetylene is shipped dissolved in either Acetone or Dimethylformamide which under extreme withdrawal rates may be released with the Acetylene from the cylinder. (See Special Packaging Recommendations). ACGIH, 1997 lists a TWA of 10 Molar PPM for Dimethylformamide with a skin notation and 500 Molar PPM with a STEL of 750 Molar PPM for Acetone. Each has a A4 (Not Classifiable as a Human Carcinogen) carcinogen rating. OSHA 1995 lists a PEL (8hr. TWA) of 10 Molar PPM with a skin designation for Dimethylformamide and 1,000 Molar PPM for Acetone.

Oxygen levels should be maintained at greater than 18 Molar percent at normal atmospheric pressure ($pO_2 > 135$ torr).

RECOMMENDED FIRST AID TREATMENT: (Continued)

CAUTION: Welding or brazing may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z-49.1 "Safety in Welding and Cutting" published by the American Welding Society and OSHA safety regulations under 29 CFR 1910.252 "Welding, Cutting and Brazing." Also see ACGIH TLYs (1997) Appendix B, Section B2, "Welding Fumes " ARC RAYS can injure eyes and burn skin.

FIRE AND EXPLOSION HAZARD DATA

UEL: (Continued)

Pure acetylene can ignite by decomposition above 30 psia (207 kPa); therefore, the UEL is 100% if the ignition source is of sufficient intensity.

UNUSUAL FIRE AND EXPLOSION HAZARDS: (Continued)

extinguished without stopping the flow of gas can easily reignite with possible explosive force. Acetylene has a density very similar to that of air so when leaking it does not readily dissipate.

REACTIVITY DATA

INCOMPATIBILITY (Materials to avoid): (Continued)

Forms explosive acetylide compounds with copper, mercury, silver, brasses containing more than 66% copper and brazing materials containing silver or copper.

ACETYLENE

SPECIAL PRECAUTIONS

OTHER RECOMMENDATION OR PRECAUTIONS: (Continued)

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

Consult manufacturer's MSDS sheet on welding consumables and related products for reactivity and health hazard data and for further information regarding welding fumes.

Reportiny under SARA, Title III, Section 313 not required.

NFPA 704 No. for acetylene = 1 4 3 None