

# MATERIAL SAFETY DATA SHEET



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MAJOR SUPPLIERS OF CRYOGENICS AND WELDING EQUIPMENT

MSDS # N0000302

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## SECTION 1. MATERIAL IDENTIFICATION

|                                      |                              |                                   |      |
|--------------------------------------|------------------------------|-----------------------------------|------|
| <u>Product Name</u>                  | CAS # 74-86-2                | <u>NFPA CODE 704/ HMIS</u>        |      |
| Acetylene                            |                              | Health                            | 1    |
|                                      |                              | Fire                              | 4    |
|                                      |                              | Reactivity                        | 3    |
| <u>Trade Name And Synonym</u>        | <u>DOT Identification No</u> | Special Hazard                    | None |
| Acetylene, Dissolved (D.O.T.) Ethyne | UN1001                       |                                   |      |
| <u>Chemical Name And Synonyms</u>    |                              | <u>DOT Hazard Class</u>           |      |
| Acetylene, Ethyne                    |                              | Division 2.1                      |      |
| <u>Formula</u>                       | <u>Chemical Family</u>       | <u>Description</u>                |      |
| C <sub>2</sub> H <sub>2</sub>        | Alkyne                       | Heating, Cutting and Welding fuel |      |

## SECTION 2. HEALTH HAZARD INFORMATION

### Time Weighted Average Exposure Limit

Acetylene is defined as a simple asphxiant (ACGIH 1993-1994). No TWA listed by OSHA (1993). Oxygen levels should be maintained at greater than 18 Molar percent at normal atmospheric pressure (pO<sub>2</sub>>135 torr).

### Symptoms Of Exposure

INHALATION: 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.

### Toxicological Properties

As a narcotic gas or intoxicant causes hypercapnia (an excessive amount of carbon dioxide in the blood). Repeated exposures to tolerable levels has 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.

### 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 mouth-to-mouth resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

## SECTION 3. PHYSICAL DATA

|  |   |
|--|---|
| <u>Boiling Point</u>                   | <u>Liquid Density at Boiling Point</u>                              |
| Sublimation Point = -118.8°F (-83.8°C) | @ -116°F (-82°C) = 38.8 lb/ft <sup>3</sup> (622 kg/m <sup>3</sup> ) |

Vapor Pressure @ 70° F (21.1°C)

645 psia (4450 kPa)

Solubility In Water

Soluble

Evaporation Rate

N/A, dissolved gas

Appearance And Odor

Pure acetylene is a colorless gas with an ethereal odor. Commercial (carbide) acetylene has a distinctive garlic-like odor.

Gas Density at 70°F 1 ATM.0691 lb/ft<sup>3</sup> (1.107 kg/m<sup>3</sup>)Freezing Point

-113°F (-80.6°C)

Specific Gravity (AIR = 1)

@ 68°F (20°C) = 0.906

**SECTION 4. FIRE AND EXPLOSION HAZARD DATA**Flash Point

Gas

Auto Ignition Temperature

565°F (296°C)

Flammable Units Percent by Volume

LEL 2.2

UEL 80-85

See "Special Notes" section.

Extinguishing Media

Carbon dioxide; dry chemical

Electrical Classification

Class 1, Group A

Special Firefighting Procedure

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 COMBUSTIBLE IN AIR AT PRESSURES ABOVE 30 PSIA (207 kPa). It requires a very low ignition energy so that fires which have been extinguished without stopping the flow of gas can easily re-ignite with possible explosive force. Acetylene has a density very similar to that of air so when leaking it does not readily dissipate.

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.

**SECTION 5. REACTIVITY DATA**Stability

- Unstable  
 Stable

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.

Hazardous Polymerization

- May Occur  
 Will Not Occur

Conditions To Avoid

None

Incompatibility: (Materials to Avoid)

Oxygen and other oxidizers, including all of the halogens and halogenated compounds. Forms explosive acetylide compounds with copper, mercury, silver, brasses containing more than 66% copper and brazing materials containing silver or copper.

Hazardous Decomposition Products

Carbon and hydrogen

**SECTION 6. SPILL, LEAK AND DISPOSAL 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

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.

**SECTION 7. SPECIAL PROTECTION INFORMATION**Respiratory Protection

Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

| <u>Ventilation</u>           | <u>Local Exhaust</u>                  | <u>Special</u> |
|------------------------------|---------------------------------------|----------------|
| Hood with forced ventilation | To prevent accumulation above the LEL | N/A            |
|                              | <u>Mechanical</u>                     | <u>Other</u>   |
|                              | In accordance with electrical codes   | 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

**SECTION 8. SPECIAL PRECAUTIONS AND COMMENTS**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 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 125°F (52°C). 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 from being stored for excessive periods of time. Post "No Smoking" or "Open Flames" signs in the storage area. There should be no sources of ignition in the storage area.

For additional recommendations, consult Compressed Gas Association 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).

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 pickup type vehicles.

Special Notes

Reporting under SARA, title III, Section 313 not required

Flammable Units Percent by Volume (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.