

# holox

## MATERIAL SAFETY DATA SHEET

G-2a

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### ACETYLENE

Telephone Number: (770) 925-4640  
Emergency Contact: CHEMTREC  
Emergency Phone Number: (800) 424-9300

#### SECTION #1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Acetylene, dissolved  
CHEMICAL NAME: Acetylene  
CHEMICAL FAMILY: Alkyne  
FORMULA: C<sub>2</sub>H<sub>2</sub>  
SYNONYMS: Ethyne, welding gas  
[USE]: Welding, instrument fuel

#### SECTION #2 - COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME /CAS NUMBER	PERCENTAGE	OSHA PEL	ACGIH TLV
ACETYLENE/74-86-2	>99%	None	Simple Asphyxiant

[LD<sub>50</sub>]: None. [LC<sub>50</sub>]: None.

#### SECTION #3 - HAZARDS IDENTIFICATION

##### EMERGENCY OVERVIEW:

DANGER! Flammable gas under pressure.  
Can form explosive mixtures with air.  
Cylinders contain fusible metal pressure relief devices in the top, bottom, or valve which melt at 208-220°F (98-104°C).  
Do not discharge cylinders at pressures above 15 psig (103 kPa).  
Garlic-like odor.

##### POTENTIAL HEALTH EFFECTS INFORMATION:

###### ROUTES OF EXPOSURE:

**INHALATION:** Simple asphyxiant. It should be noted that before suffocation could occur, the lower flammability limit of acetylene in air would be exceeded; possibly causing both an explosive and an oxygen deficient atmosphere. Exposure to moderate concentrations may cause dizziness, headache, and unconsciousness. Lack of sufficient oxygen may cause serious injury or death.

**EYE CONTACT:** None.

**SKIN CONTACT:** None.

**[SKIN ABSORPTION]:** None.

**[INGESTION]:** None.

**CHRONIC EFFECTS:** Acetylene is a non-toxic gas that has no chronic harmful effects even in high concentrations. Acetylene has been used as an anesthetic.

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** None

**OTHER EFFECTS OF OVEREXPOSURE:** None.

**CARCINOGENICITY:** Acetylene is not listed by NTP, OSHA or IARC.

#### SECTION #4 - FIRST AID MEASURES

**INHALATION:** Remove person to fresh air. If not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention.

**EYE CONTACT:** Not applicable.

**SKIN CONTACT:** Not applicable.

**INGESTION:** Not applicable.

**NOTES TO PHYSICIAN:** None.

#### SECTION #5 - FIRE FIGHTING MEASURES

**FLASH POINT:** Not applicable; gas. **AUTOIGNITION:** 581°F (305°C) @ 1 atm.

**FLAMMABLE LIMITS IN AIR BY VOLUME:**

**LOWER:** 2.5%. **UPPER:** 80%.

**EXTINGUISHING MEDIA:** Carbon Dioxide, Dry Chemical, Water.

**SPECIAL FIRE FIGHTING INSTRUCTIONS:** Shut off source of acetylene if possible. Extinguish fire only if flow of acetylene can be stopped. Keep adjacent cylinders cool by spraying large amounts of water until the fire burns itself out and the cylinders are cool. If a flame is extinguished and acetylene continues to escape, an explosive re-ignition could occur.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Excessive heat or fire will cause fusible metal pressure relief device to melt allowing acetylene to escape. Cylinders may

rupture violently if sidewalls are exposed to direct flame impingement. Cylinders exposed to fire should not be moved until they have reached ambient temperature in the event internal decomposition is taking place.

**HAZARDOUS COMBUSTION PRODUCTS:** Carbon monoxide, carbon dioxide.  
**[SENSITIVITY TO STATIC DISCHARGE]:** Ignitable by static electricity.  
**[SENSITIVITY TO MECHANICAL IMPACT]:** Decomposition may occur.

#### SECTION #6 - ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Evacuate immediate area. Eliminate any possible source of ignition, and provide maximum explosion-proof ventilation. Shut off source of acetylene, if possible. Isolate any leaking cylinder. If leaking from cylinder, valve, or fusible metal pressure release device, contact your supplier. Never enter a confined space or other area where the concentration is greater than 10% of the lower flammable limit which is 0.25%.

#### SECTION #7 - HANDLING AND STORAGE

**PRECAUTIONS TO BE TAKEN IN STORAGE:** Store and use with adequate ventilation. Cylinders should be separated from oxygen and other oxidizers by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire resistance rating of at least 1/2 hour. Storage in excess of 2,500 cu. ft. is prohibited in buildings with other occupancies. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling or being knocked over. Protect cylinders from physical damage; do not drag, roll, slide or drop. Use a suitable hand truck for cylinder movement. Post "No Smoking Or Open Flames" signs in the storage or use areas. There should be no sources of ignition. All electrical equipment should be explosion-proof in the storage and use areas. Storage areas must meet national electric codes for class 1 hazardous areas.

Do not allow storage temperature to exceed 125°F (52°C). Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time.

**PRECAUTIONS TO BE TAKEN IN HANDLING:** All acetylene piped systems and associated equipment must be grounded. Non-sparking tools should be used. Never use copper piping for acetylene service, only steel or wrought iron pipe should be used. An acetylene cylinder valve should be opened the minimum amount required to deliver acceptable flow so that it can be closed as quickly as possible in an emergency situation. Do not open acetylene cylinder valves more than one and one-half turns. Never use acetylene in excess or 15 psig pressure. Acetylene cylinders are heavier than other cylinders because they are packed with a porous filler material and acetone. Leak check with soapy water; never use a flame. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Do not strike cap with a hammer. Use an adjustable strap wrench to remove over-tight or rusted caps. Never strike an arc on a compressed gas cylinder or make a cylinder part of an electrical circuit. For additional precautions in using acetylene see Section 16 - Other Information.

When used in welding and cutting: Read and understand the manufacturer's instructions and the precautionary label on the products. See American National Standard Institute (ANSI) Z49.1 *Safety in Welding and Cutting* published by the American Welding Society, P.O. Box 35140, Miami, Florida 33135 and National Fire Protection Association (NFPA) 51 *Oxygen Fuel Gas Welding & Cutting*.

#### SECTION #8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

##### ENGINEERING CONTROLS:

**VENTILATION:** Provide adequate natural or explosion-proof mechanical ventilation to ensure acetylene does not accumulate and reach its lower explosive limit of 2.5%.

##### RESPIRATORY PROTECTION (SPECIFY TYPE):

**General Use:** None required.

**Emergency Use:** Air supplied respirators are required in oxygen-deficient atmospheres (air purifying respirators will not function). Before entering area you must check for flammable and oxygen deficient atmospheres.

**PROTECTIVE GLOVES:** Work gloves are recommended when handling cylinders.

**EYE PROTECTION:** Safety glasses are recommended when handling cylinders.

**OTHER PROTECTIVE EQUIPMENT:** Safety shoes are recommended when handling cylinders. Cotton clothing is recommended for use to prevent static electric buildup.

#### SECTION #9 - PHYSICAL AND CHEMICAL PROPERTIES

**MOLECULAR WEIGHT:** 26.04

**BOILING POINT (1 ATM):** -103.4°F (-75°C) @ 10 psig

**SPECIFIC GRAVITY (Air =1):** -At 70°F (21.1°C) and 1 atm: 0.906

**FREEZING POINT/MELTING POINT:** At 10 psig: -116°F (-82.2°C)

**VAPOR PRESSURE (AT 20°C):** At 70°F (21.1°C): 635 psig

**GAS DENSITY:** At 32°F (0°C) and 1 atm: 0.07314 lb/cu ft (1.176 kg/m<sup>3</sup>)

**EVAPORATION RATE (Butyl Acetate=1):** N/A (Gas)

**SOLUBILITY IN WATER:** Vol/Vol at 32°F (0°C) at 1 atm: 1.7

**EXPANSION RATIO:** Not applicable.

**[pH]:** Not applicable

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**APPEARANCE, ODOR AND STATE:** Colorless gas. Acetylene of 100% purity is odorless but commercial purity has a distinctive garlic-like odor.

**[COEFFICIENT OF WATER/OIL DISTRIBUTION]:** None available

**[ODOR THRESHOLD]:** 565 ppm

### SECTION #10 - STABILITY AND REACTIVITY

**STABILITY:** Unstable. Stable as shipped. Do not use at pressure above 15 psig (103 kPa).

**CONDITIONS TO AVOID:** Cylinders should not be exposed to sudden shock or sources of heat.

**INCOMPATIBILITY (Materials to Avoid):** Under certain conditions, acetylene can react with copper, silver, and mercury to form acetylides, compounds which can act as ignition sources. Brasses containing less than 65% copper in the alloy and certain nickel alloys are suitable for acetylene service under normal conditions. Acetylene can react explosively when combined with oxygen and other oxidizers including all halogens and halogen compounds. The presence of moisture, certain acids, or alkaline materials tends to enhance the formation of copper acetylides.

#### REACTIVITY:

A) **HAZARDOUS DECOMPOSITION PRODUCTS:** Hydrogen, carbon.

B) **HAZARDOUS POLYMERIZATION:** Will not occur.

### SECTION #11 - TOXICOLOGICAL INFORMATION

Acetylene is a simple asphyxiant.

**[LCLo]:** 30% inhalation-man/5min      **[TCLo]:** (Anesthesia) 33% inhalation-man/7min

**[IRRITANCY OF MATERIAL]:** None.      **[SENSITIZATION TO MATERIAL]:** None.

**[REPRODUCTIVE EFFECTS]:** None.

**[TERATOGENICITY]:** None.      **[MUTAGENICITY]:** None.

**[SYNERGISTIC MATERIALS]:** None.

### SECTION #12 - ECOLOGICAL INFORMATION

No adverse ecological effects are expected. Acetylene does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82). Acetylene is not listed as a marine pollutant by DOT (49 CFR Part 171).

### SECTION #13 - DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:** Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

Unserviceable cylinders should be returned to the supplier for safe and proper disposal.

### SECTION #14 - TRANSPORT INFORMATION

**DOT/IMO SHIPPING NAME:** Acetylene, dissolved.

**HAZARD CLASS:** 2.1 (Flammable gas)

**IDENTIFICATION NUMBER:** UN 1001      **[PIN]:** 1001

**PRODUCT RQ:** None.

**SHIPPING LABEL(s):** Flammable gas.

**PLACARD (When required):** Flammable gas.

**SPECIAL SHIPPING INFORMATION:** Cylinders should be transported in a secure position, in a well ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards and should be discouraged.

### SECTION #15 - REGULATORY INFORMATION

The following information concerns selected regulatory requirements potentially applicable to this product. Not all such requirements are identified. Users of this product are responsible for their own regulatory compliance on a federal, state (provincial), and local level.

#### U.S. FEDERAL REGULATIONS:

##### EPA - ENVIRONMENTAL PROTECTION AGENCY

**CERCLA:** Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

**SARA:** Superfund Amendment and Reauthorization Act

**SECTION 302/304:** Requires emergency planning on threshold planning quantities (TPQ) and release reporting based on reportable quantities (RQ) of EPA's extremely hazardous substances (40 CFR Part 355).

Extremely Hazardous Substances: None

Threshold Planning Quantity (TPQ): None

**SECTIONS 311/312:** Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes (40 CFR Part 370). The hazard classes for this product are:

IMMEDIATE:	No	PRESSURE:	Yes
DELAYED:	No	REACTIVITY:	Yes
		FIRE:	Yes

**SECTIONS 313:** Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Acetylene does not require reporting under Section 313

**40 CFR PART 68:** Risk Management for Chemical Accidental Release. Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Acetylene is listed as a regulated substance in quantities of 10,000 pounds (4,533 kg) or greater.

**TSCA:** Toxic Substance Control Act: Acetylene is listed on the TSCA inventory.

#### OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

**29 CFR 1910.119:** Process Safety Management of Highly Hazardous Chemicals. Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals as listed in Appendix A.

Acetylene is not listed in Appendix A as a highly hazardous chemical. However, any process that involves a flammable gas on site in one location, in quantities of 10,000 pounds (4,533 kg) or greater is covered under this regulation unless it is used as fuel.

#### [CANADIAN REGULATIONS:]

[Controlled Product Hazard Class A, B1, E. This MSDS has been prepared in compliance with Controlled Product Regulations.]

### SECTION #16 - OTHER INFORMATION

**SPECIAL PRECAUTIONS:** Use piping and equipment adequately designed to withstand pressures to be encountered. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flow.

Shipment of compressed gas cylinders which have not been filled with the owners consent is a violation of Federal law (49 CFR Part 173.301(b)).

**MIXTURES:** When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

#### OTHER INFORMATION:

	NFPA RATINGS:	HMIS RATINGS:
NFPA CODE	HEALTH: = 0	HEALTH: = 1
HEALTH	FLAMMABILITY: = 4	FLAMMABILITY: = 4
REACTIVITY	REACTIVITY: = 3	REACTIVITY: = 3
SPECIAL HAZARD	SPECIAL: = None	

#### STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

**THREADED:** CGA 510 standard for cylinders greater than 50 cu. ft. For additional limited standard connections see CGA Pamphlet V-1 *Compressed Gas Cylinder Valve Outlet and Inlet Connections*.

**PIN-INDEXED YOKE:** Not Applicable

**ULTRA HIGH INTEGRITY:** Not Applicable

Use the proper CGA connections. **DO NOT USE ADAPTERS**

Further information about acetylene can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703)412-0900.

- G-1.1 *Commodity Specification for Acetylene*
- G-1 *Acetylene*
- P-1 *Safe Handling of Compressed Gases in Containers*
- SB-4 *Handling Acetylene Cylinders in Fire Situations*
- SB-8 *Use of Oxy-fuel Gas Welding and Cutting Apparatus*