



Material Safety Data Sheet

ACETYLENE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION (Rev. 12/92)

Airco Gases
575 Mountain Avenue
Murray Hill, NJ 07974

TELEPHONE NUMBER: (908)464-8100

EMERGENCY TELEPHONE NUMBER
CHEMTREC (800)424-9300

PRODUCT NAME: ACETYLENE
PRODUCT CODE: MSDS CODE G-2
CHEMICAL NAME: Acetylene
CAS NUMBER: 74-86-2
CHEMICAL FAMILY: Alkyne
CHEMICAL FORMULA: C2H2
RTECS NUMBER: AO9600000
MSDS IDENTIFICATION CODE/NUMBER: G-2

SYNONYMS: ETHENE
ETHYNE
G-2

2. COMPOSITION/INFORMATION ON INGREDIENTS (Rev. 12/92)

Table with 3 columns: INGREDIENT NAME, EXPOSURE LIMITS, CONCENTRATION PERCENT BY WEIGHT. Rows include Acetone and Acetylene with their respective exposure limits and concentrations.

Acetylene is shipped in a cylinder packed with a porous mass material, and a liquid solvent, commonly acetone. Acetylene is dissolved in the acetone solution and dispersed throughout the porous medium. When the valve of a charged acetylene cylinder is opened, the acetylene comes out of solution and passes out in the gaseous form.

Under normal operating conditions, acetone is not released from the cylinder. However, if the cylinder is overcharged with acetone or acetylene, acetone may occasionally "spit" out.

3. HAZARDS IDENTIFICATION (Rev. 12/92)

***** EMERGENCY OVERVIEW *****
DANGER: FLAMMABLE GAS UNDER PRESSURE.
CAN FORM EXPLOSIVE MIXTURES WITH AIR. FUSIBLE PLUGS IN TOP, BOTTOM, OR VALVE MELT AT 208 TO 220°F.

Material Safety Data Sheet

ACETYLENE

3. HAZARDS IDENTIFICATION - Continued

- * DO NOT DISCHARGE AT PRESSURES ABOVE 15 PSIG. MAY CAUSE ANESTHETIC EFFECTS.
- * ODOR: Garlic-like. Keep away from heat, flame and sparks. Store and use with adequate ventilation. Avoid breathing gas. Close valve after each use and when empty. NOTE: Cylinder contains acetone solvent which may cause irritation if released from the cylinder. FIRST AID: If Inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

POTENTIAL HEALTH EFFECTS

PRIMARY ROUTE(S) OF ENTRY

Inhalation: Primary Dermal: Secondary Eyes: Secondary Ingestion: No

EYES
None

SKIN
None

INGESTION

Ingestion is unlikely, since acetylene is a gas at room temperature.

INHALATION

Acetylene is an asphyxiant and may cause anesthetic effects at high concentrations. Oxygen levels should be maintained at greater than 19.5% at normal atmospheric pressure. High concentrations so as to exclude an adequate supply of oxygen to the lungs causes dizziness, deeper breathing due to air hunger, possible nausea and eventual unconsciousness.

Inhalation of the acetone solvent may cause dizziness, lightheadedness and respiratory irritation.

4. FIRST AID MEASURES (Rev. 11/92)

EYES

None normally required. Consult a physician if direct contact with pressurized material occurs. Immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Get medical attention.

SKIN

Wash affected areas with soap and warm water. If irritation develops, seek medical attention.

INGESTION

None normally required.

INHALATION

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive. Keep victim warm and quiet.

Material Safety Data Sheet

ACETYLENE

5. FIRE FIGHTING MEASURES (Rev. 12/92)

FLAMMABLE PROPERTIES

FLASH POINT: Gas
AUTOIGNITION: 565°F 296°C
LOWER EXPLOSIVE LIMIT (%): 2.2
UPPER EXPLOSIVE LIMIT (%): 80 - 85*

FIRE AND EXPLOSION HAZARDS

*Pure acetylene can ignite by decomposition above 15 psig; therefore, the UEL is 100% if the ignition source is of sufficient intensity.

Electrical Classification: Class 1, Group A.

GASEOUS ACETYLENE IS SPONTANEOUSLY COMBUSTIBLE IN AIR AT PRESSURES ABOVE 15 PSI (207 kPa.). It requires a very low ignition energy so that fires which have been 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. Gas may travel to a source of ignition and flash back.

Fires involving acetylene occur occasionally at fusible metal pressure relief plugs at the tops and bottoms of cylinders, commonly due to hot metal or slag being dropped on the fusible plugs. When the fusible plug releases a large volume of acetylene will rush out, creating a "roaring" sound. The flame may extend a foot or two away from the cylinder until the pressure is reduced. In some cases, the other end of the cylinder may develop a coating of frost.

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical.

FIRE FIGHTING INSTRUCTIONS

WARNING: ALWAYS EXTINGUISH A FIRE BEFORE CLOSING THE CYLINDER VALVE.

If the flame is small from the fusible plug or valve stem, try to put it out. Wear SCBA and fully protective clothing for fire fighting. If the fire is allowed to keep burning it is likely that the fusible plug will melt and result in a large release of acetylene. A glove or heavy cloth or any wet material slapped on the flame will frequently extinguish it.

If the flame is large burning from a fusible plug, DO NOT try to put it out unless the cylinder is outdoors or in a very well ventilated area free from sources of ignition. Usually it is very difficult to extinguish large fires because the escaping acetylene may be reignited by adjacent ignition sources, thereby possibly creating a confined space explosion. Keep containers cool with water spray.

6. ACCIDENTAL RELEASE MEASURES (Rev. 12/92)

Evacuate all personnel from affected areas. Isolate the area for over 1/2 mile in all directions in the event of leakage of a tank, rail car or tank truck. Use appropriate protective equipment.

If possible to do safely, shut off ignition sources and stop the leak by closing the valve. For small leaks, cylinders may be moved to an area outdoors and away from any source of ignition. Circumstances which it is advisable to attempt removal of the cylinder are when cylinders are in close proximity to other compressed gases, when highly flammable materials or hazardous materials are in the vicinity of the acetylene cylinder(s), or where protection of the building is unusually difficult and spreading of a fire may produce a major loss of life or property. When the cylinder is removed, it may be hosed down with water to keep it cool. Open valve slowly to let the acetylene escape. Tag the cylinder with "WARNING - Leaking Flammable Gas". Close valve when empty.

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,

Revision Date: 12/21/92

Page 3 of 8

Material Safety Data Sheet

ACETYLENE

6. ACCIDENTAL RELEASE MEASURES - Continued

contact CHEMTREC for emergency assistance or call your closest Airco location.

7. HANDLING AND STORAGE (Rev. 12/92)

HANDLING AND STORAGE PRECAUTIONS

IT IS CRUCIAL THAT FUSE PLUGS IN THE TOPS AND BOTTOMS OF ALL ACETYLENE CYLINDERS BE THOROUGHLY INSPECTED WHENEVER HANDLED. REMOVE AND QUARANTINE IN A SAFE LOCATION ANY DEFECTIVE CYLINDER.

Post "NO SMOKING OR OPEN FLAMES" signs in the storage area or use area. There should be no sources of ignition in the storage or use area.

Use only in well-ventilated areas. Stationary customer site vessels should be operated in accordance with the manufacturer's and Airco instructions. Do not attempt to repair, adjust or in any other way modify the operation of these vessels. If there is a malfunction or other type of operations problem with the vessel, contact the closest Airco location immediately for assistance.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. DO NOT allow the temperature where cylinders are stored to exceed 125°F. Cylinders should 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.

Valve protection caps must remain in place unless container is secured with valve outlet piping to use point. Close valve after each use and when the container is empty. Do not drag, slide or roll cylinders on their sides. Use a suitable hand truck for container movement. Use a pressure reducing regulator when connecting container to piping or systems. Do not use gas directly from container. Do not heat container by any means to increase the discharge rate of product from the container.

HANDLING PRECAUTIONS

Never attempt to repair or alter cylinders. Never tamper with pressure relief devices or fusible plugs. Under no circumstances allow a torch flame to contact the fusible plug. While welding, avoid contact of the cylinder welding equipment or electrical circuits.

Never use wrenches or tools other than those provided by AIRCO to open valves. Never use a torch to loosen valves.

If rough handling or other occurrences should cause any fusible plug to leak, move the cylinder to an open space well away from an possible source of a sign on the cylinder warning of "Leaking Flammable Gas".

STORAGE PRECAUTIONS

DO NOT STORE NEAR OXYGEN OR FLAMMABLE MATERIALS.

Unless oxygen and acetylene are separated, there should be a non-combustible partition of at least 5 ft. high with a fire resistance rating of one-half hour between cylinders. In the U.S. cylinders stored inside a building near user locations must be limited to a total capacity of 2500 ft³ of gas, exclusive of in-use or attached for use cylinders.

Do not store cylinders on their side. This makes the acetylene less stable and less safe, and increases the likelihood of solvent loss and resultant decomposition.

Material Safety Data Sheet

ACETYLENE

8. SPECIAL PROTECTIVE MEASURES (Rev. 11/92)

ENGINEERING CONTROLS

Provide general room ventilation and local exhaust to prevent accumulation above the exposure limit and to maintain oxygen levels above 19.5%. Mechanical ventilation should be designed in accordance with electrical codes.

EYE/FACE PROTECTION

Safety goggles or glasses recommended.

SKIN PROTECTION

PVC or rubber in laboratory; as required for cutting and welding.

RESPIRATORY PROTECTION

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

OTHER/GENERAL PROTECTION

Safety shoes

9. PHYSICAL AND CHEMICAL PROPERTIES (Rev. 12/92)

APPEARANCE

A colorless gas.

ODOR

Pure acetylene has an etheral odor. Commercial (carbide) acetylene has a distinctive garlic-like odor.

BASIC PHYSICAL PROPERTIES

PHYSICAL STATE: Gas
BOILING POINT: -118.8°F -83.8°C
MELTING POINT: -113°F -80.6°C
VAPOR PRESSURE: 635 psia
SPECIFIC GRAVITY: 0.906
MOLECULAR WEIGHT: 26.04
SOLUBILITY (H₂O): Soluble
PERCENT VOLATILES: 100
VOLATILE ORGANIC COMPOUNDS (VOC) CONTENT: 00

10. STABILITY AND REACTIVITY (Rev. 12/92)

STABILITY: Unstable - shock sensitive in the liquid state

CONDITIONS TO AVOID (STABILITY)

Do not allow free gas (outside of cylinder) to exceed 15 psig. Do not expose cylinders to sudden shock or heat. Acetylene will decompose violently with cylinder failure.

INCOMPATIBLE MATERIALS

Oxygen and other oxidizers including all halogens and halogen compounds. Forms explosive acetylides with copper, mercury, silver, brasses containing >66% copper and brazing materials containing silver or copper.

HAZARDOUS DECOMPOSITION PRODUCTS

Acetylene decomposes at high pressure to its constituent elements of carbon and hydrogen. Carbon monoxide may be produced from burning.

Under certain conditions, acetylene forms readily explosive acetylides compounds when in contact with copper, silver, and mercury. Therefore, use of acetylene and these metals, or their salts, compounds, and high concentration alloys should be avoided.

The presence of moisture, certain acids or alkaline materials tends to enhance the formation of copper acetylides.

Material Safety Data Sheet

ACETYLENE

10. STABILITY AND REACTIVITY - Continued

HAZARDOUS POLYMERIZATION:

Temperatures as low as 250 °F at high pressure, or at low pressure in the presence of a catalyst are sufficient to initiate a polymerization reaction. The hazard here is that the polymerization normally liberates heat and may, therefore, lead to ignition and decomposition of acetylene if conditions permit.

11. TOXICOLOGICAL INFORMATION (Rev. 12/92)

EYE EFFECTS

Contact of acetone solvent with the eyes may cause temporary irritation.

SKIN EFFECTS

Skin effects are not likely. Contact with liquid acetone may cause irritation and dermatitis upon repeated exposures.

ACUTE INHALATION EFFECTS

When acetylene is mixed with oxygen in high percentages it acts as a narcotic and an anesthetic. In higher concentrations (above the Lower Explosive Limit), acetylene acts as an asphyxiant by diluting oxygen in the air that is necessary to support life.

Low concentrations (10-20% in air) cause symptoms similar to that of being intoxicated. As a narcotic gas or intoxicant, it causes hypercapnia (an excessive amount of carbon dioxide in the blood). Repeated exposures to tolerable levels has not shown deleterious effects.

Exposure to the acetone component is unlikely unless cylinder is leaking on its side. Acetone is primarily a central nervous system toxin causing headache, nausea, dizziness, vomiting and fatigue. Moderate concentrations may cause respiratory irritation.

MISCELLANEOUS TOXICOLOGICAL INFORMATION

Carcinogenicity: NTP: No

IARC: No

OSHA: No

12. ECOLOGICAL INFORMATION

NO DATA GIVEN

13. DISPOSAL CONSIDERATIONS

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 Airco for proper disposal.

14. TRANSPORT INFORMATION (Rev. 12/92)

PROPER SHIPPING NAME: Acetylene, dissolved

HAZARD CLASS: 2.1

DOT IDENTIFICATION NUMBER: UN1001

DOT SHIPPING LABEL: Flammable Gas

PACKAGING EXCEPTIONS: None

Material Safety Data Sheet

ACETYLENE

15. REGULATORY INFORMATION (Rev. 12/92)

U.S. FEDERAL REGULATORY INFORMATION
Acetone is regulated as a Hazardous Substance under CERCLA.

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III - HAZARD CLASSES: Acute Health Hazard
Fire Hazard
Sudden Release of Pressure Hazard
Reactivity Hazard

SARA TITLE III - SECTION 313 SUPPLIER NOTIFICATION
This product contains the following toxic chemicals subject to reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

CAS NUMBER	INGREDIENT NAME	PERCENT OF WEIGHT
67-64-1	Acetone	Unknown

This information must be included on all MSDSs that are copied and distributed for this material.

REGULATED INGREDIENTS

Ingredient: Acetone
CAS Number: 67-64-1
Regulations: ILL MAS NJS NJW PAW STC WHM

Ingredient: Acetylene Percent by weight: 95.0 to 99.6
CAS Number: 74-86-2
Regulations: ILL MAS NJS NJW PAW WHM

- ILL - Illinois Toxic Substance
- MAS - Massachusetts Hazardous Substance
- NJS - New Jersey Special Health Hazardous Substance
- NJW - New Jersey Workplace Hazardous Substance
- PAW - Pennsylvania Workplace Hazardous Substance
- STC - SARA Section 313 Toxic Chemical
- WHM - WHMIS (Canada)

CANADIAN REGULATORY INFORMATION

In Canada, regulations limit the capacity of acetylene cylinders stored inside a building at user locations to a total capacity of 2160 ft³ of gas in unsprinklered combustible structures, or 6130 ft³ in sprinklered buildings of combustible or non-combustible structures.

16. OTHER INFORMATION (Rev. 12/92)

OTHER INFORMATION
For additional information, consult the Compressed Gas Association (CGA) pamphlets P-1, G-1, SB-4-1990; NFPA #51-1984, and OSHA 1910 Subpart H & Q.

NFPA HAZARD RATING - HEALTH: 1 Slight
- FIRE: 4 Extreme
- REACTIVITY: 3 High

MSDS IDENTIFICATION CODE/NUMBER: G-2

SUPERCEDES MSDS DATED: 09/23/92

7

Material Safety Data Sheet

ACETYLENE

16. OTHER INFORMATION - Continued

REVISION SUMMARY

Since 09/23/92 this MSDS has been revised in the following sections:

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION
2. COMPOSITION/INFORMATION ON INGREDIENTS
3. HAZARDS IDENTIFICATION
4. FIRST AID MEASURES
5. FIRE FIGHTING MEASURES
6. ACCIDENTAL RELEASE MEASURES
7. HANDLING AND STORAGE
8. SPECIAL PROTECTIVE MEASURES
9. PHYSICAL AND CHEMICAL PROPERTIES
10. STABILITY AND REACTIVITY
11. TOXICOLOGICAL INFORMATION
14. TRANSPORT INFORMATION
15. REGULATORY INFORMATION
16. OTHER INFORMATION

REFERENCE DOCUMENTATION

The primary references used in the creation of this document include:

- o AIRCO Gases Safety Bulletins and product labels
- o Compressed Gas Association Safety Bulletin SB-4-1990
- o Handbook of Compressed Gases
- o Compressed Gas Association CGA G-1-1972
- o OSHA 29 CFR 1910.1000, and Subpart H & Q
- o DOT Emergency Response Guidebook
- o ACGIH Guide To Occupational Exposure Limits - 1992
- o NIOSH Registry of Toxic Effects of Chemical Substances (RTECS)
- o U.S. Coast Guard/U.S. DOT CHRIS Hazardous Chemical Data

N/A = Not Applicable

- = approximately equal to

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Airco Gases