

SAFETY DATA SHEET

Version 1.26
Revision Date 24.02.2014

MSDS Number 300000000002
Print Date 16.05.2015

SECTION 1: Identification of the substance/mixture and the company/undertaking

Product identifier : Acetylene

Chemical formula : C₂H₂

Synonyms : Acetylene (dissolved), Ethyne, welding gas

Refer to Section 3 for REACH information

Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Manufacture of Substance - PROC 1, PROC 2, PROC 8a, PROC 8b Use as a Fuel - PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 16, PROC 19 Welding, cutting, heating, brazing and soldering applications - PROC 16 Metal coating by spray gun - PROC 16 Lubrication of moulds for manufacture of glass bottles - PROC 17 Low pressure carburizing of steels - PROC 22 Fuel gas of the flame in analyzers by atomic absorption (AAS). - PROC 3 Use for electronic component manufacture - PROC 1 Using gas alone or in mixtures for the calibration of analysis equipment - PROC 3 Using gas as feedstock in chemical processes - PROC 1

Restrictions on Use : No data available.

Details of the supplier of the safety data sheet : Air Products Plc
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Westmere Drive
Crewe
Cheshire

Email Address – Technical Information : GASTECH@airproducts.com

Telephone : +44(0)8457 020202

Emergency telephone number (24h) : 1. Cylinder 0500 020202 / +44 870 190 6874
2. Bulk 0500 020202 / +44 2030 240 571
3. Medical 0500 020202 / +44 1270 218 050

SECTION 2: Hazards identification

Classification according to Regulation 1272/2008 (CLP)

Flammable gases - Category 1 H220:Extremely flammable gas.
Chemically unstable gases - Category A H230:May react explosively even in the absence of air.
Gases under pressure - Dissolved gas H280:Contains gas under pressure; may explode if heated.

Classification (Directive)

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F+ Extremely flammable

R 5 Heating may cause an explosion.

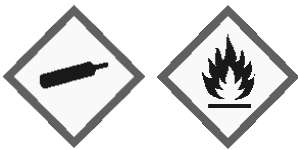
R 6 Explosive with or without contact with air.

R12 Extremely flammable.

Dispose of cylinder via gas supplier only, inner porous material may contain asbestos.

Label Elements according to Regulation 1272/2008 (CLP)

Hazard pictograms/symbols



Signal Word: Danger

Hazard Statements:

H220:Extremely flammable gas.

H230:May react explosively even in the absence of air.

H280:Contains gas under pressure; may explode if heated.

Precautionary Statements:

Prevention : P210:Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response : P377 :Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 :Eliminate all ignition sources if safe to do so.

Storage : P403:Store in a well-ventilated place.

Other hazards

High pressure gas.

Can cause rapid suffocation.

Extremely flammable.

May form explosive mixtures in air.

Immediate fire and explosion hazard exists when mixed with air at concentrations exceeding the lower flammability limit (LFL).

High concentrations that can cause rapid suffocation are within the flammable range and should not be entered.

Avoid breathing gas.

Self contained breathing apparatus (SCBA) may be required.

Environmental Effects

Not harmful.

SECTION 3: Composition/information on ingredients

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Substance/Mixture : Substance

| Components | EINECS / ELINCS Number | CAS Number | Concentration (Volume) |
|------------|------------------------|------------|------------------------|
| Acetylene | 200-816-9 | 74-86-2 | 100 % |

| Components | Classification (Directive) | Classification (CLP) | REACH Reg. # |
|------------|----------------------------|--|------------------|
| Acetylene | F+ R 5 ; R 6 ; R12 | Flam. gas 1 ;H220 Chem. Unst. Gas A ;H230 Press. Gas (Comp.) ;H280 | 01-2119457406-36 |

If REACH registration numbers do not appear the substance is either exempt from registration, does not meet the minimum volume threshold for registration, or the registration date has not yet come due. Refer to section 16 for full text of each relevant R-phrase and H-phrases.

Concentration is nominal. For the exact product composition, please refer to Air Products technical specifications. For safety reasons, the acetylene is dissolved in acetone (Flam. Liq. 2, Eye Irrit. 2, STOT SE 3) or dimethylformamide (Flam. Liq. 3, Repr. 1B, Acute Tox. 4, Eye Irrit. 2) in the gas receptacle. Vapour of the solvent is carried away as impurity when the acetylene is extracted from the gas receptacle. The concentration of the solvent vapour in the gas is lower than the concentration limits to change the classification of the acetylene. Dimethylformamide is on the Candidate List of Substances of Very High Concern (SVHC) that might be subject to authorization for future placing on the market and uses. The applicable information from the exposure scenarios for this product are contained in the main body of the SDS.

SECTION 4: First aid measures

Description of first aid measures

- General advice : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Skin contact : Not applicable.
- Ingestion : Ingestion is not considered a potential route of exposure.
- Inhalation : In case of shortness of breath, give oxygen. Move to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Seek medical advice.

Most important symptoms and effects, both acute and delayed

- Symptoms : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness.

Indication of any immediate medical attention and special treatment needed

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No data available.

SECTION 5: Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

Extinguishing media which must not be used for safety reasons. : Halons. Carbon dioxide (CO₂).

Special hazards arising from the substance or mixture : Incomplete combustion may form carbon monoxide. Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Keep containers and surroundings cool with water spray. Extinguish fire only if gas flow can be stopped. If possible, shut off the source of gas and allow the fire to burn itself out. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Move away from container and cool with water from a protected position. Keep adjacent cylinders cool by spraying with large amounts of water until fire burns itself out. If flames are accidentally extinguished, explosive re-ignition may occur; therefore, appropriate measures should be taken (e.g. total evacuation to protect persons from cylinder fragments and toxic fumes should a rupture occur).

Advice for fire-fighters : Wear self contained breathing apparatus for fire fighting if necessary.

Further information : No data available.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures : Evacuate personnel to safe areas. Remove all sources of ignition. Never enter a confined space or other area where the flammable gas concentration is greater than 10% of its lower flammable limit. Ventilate the area.

Environmental precautions : Do not discharge into any place where its accumulation could be dangerous. Should not be released into the environment. Prevent further leakage or spillage if safe to do so.

Methods and material for containment and cleaning up : Ventilate the area. Approach suspected leak areas with caution.

Additional advice : Increase ventilation to the release area and monitor concentrations. If leak is from cylinder or cylinder valve, call the Air Products emergency telephone number. If the leak is in the user's system, close the cylinder valve, safely vent the pressure, and purge with an inert gas before attempting repairs.

SECTION 7: Handling and storage

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Precautions for safe handling

Acetylene cylinders are heavier than other cylinders because they are packed with a porous filler material and acetone or dimethylformamide. Never use acetylene in excess of 15 psig pressure. Ensure adequate ventilation. Solvent may accumulate in piping systems. For maintenance activities use appropriate resistant gloves, assess the necessity to use a respiratory filter device (specify gloves and filters for DMF or acetone use), and wear safety goggles. Avoid breathing the vapour of the solvent. Provide adequate ventilation. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C (122°F). Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Use an adjustable strap wrench to remove over-tight or rusted caps. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. 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. Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Close valve after each use and when empty. Replace outlet caps or plugs and container caps as soon as container is disconnected from equipment. Do not subject containers to abnormal mechanical shock. Never attempt to lift a cylinder by its valve protection cap or guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. Purge air from system before introducing gas. When returning cylinder install valve outlet cap or plug leak tight. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C (122°F). Ensure equipment is adequately earthed.

Conditions for safe storage, including any incompatibilities

Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air. Observe all regulations and local requirements regarding storage of containers. Stored containers should be periodically checked for general condition and leakage. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C (122°F). Smoking should be prohibited within storage areas or while handling product or containers. Display "No Smoking or Open Flames" signs in the storage areas. The amounts of flammable or toxic gases in storage should be kept to a minimum. Return empty containers in a timely manner.

Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance with local regulations. Keep away from combustible material. All electrical equipment in the storage areas should be compatible with flammable materials stored. Containers containing flammable gases should be stored away from other combustible materials. Where necessary containers containing oxygen and

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oxidants should be separated from flammable gases by a fire resistant partition.

Specific end use(s)

Refer to section 1 or the extended SDS if applicable

SECTION 8: Exposure controls / personal protection

Control parameters

If applicable, refer to the extended section of the SDS for further information on CSA.

Exposure controls

Engineering measures

Provide natural or explosion-proof ventilation that is adequate to ensure flammable gas does not reach its lower explosive limit.

Personal protective equipment

- Respiratory protection : High concentrations that can cause rapid suffocation are within the flammable range and should not be entered.
- Hand protection : Sturdy work gloves are recommended for handling cylinders.
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Eye protection : Safety glasses recommended when handling cylinders.
- Skin and body protection : Safety shoes are recommended when handling cylinders.
Wear as appropriate:
Flame retardant protective clothing.
- Special instructions for protection and hygiene : Ensure adequate ventilation, especially in confined areas.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

- Appearance : Dissolved gas. Colorless gas
- Odor : Poor warning properties at low concentrations. Garlic-like.
Odor : Mixture contains one or more component(s) which have the following odor:
Garlic-like.
- Odor threshold : No data available.
- pH : Not applicable.
- Melting point/range : -113 °F (-80.8 °C)

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| Boiling point/range | : -1,484 °F (-84,2 °C) |
| Flash point | : 0 °F (-18 °C) |
| Evaporation rate | : Not applicable. |
| Flammability (solid, gas) | : Refer to product classification in Section 2 |
| Upper/lower explosion/flammability limit | : 83 %(V) / 2.4 %(V) |
| Vapor pressure | : 638.14 psia (44.00 bara) at 68 °F (20 °C) |
| Water solubility | : 1.185 g/l |
| Relative vapor density | : 0.899 (air = 1) |
| Relative density | : No data available. |
| Partition coefficient (n-octanol/water) | : Not applicable. |
| Autoignition temperature | : 325 °C |
| Decomposition temperature | : No data available. |
| Viscosity | : Not applicable. |
| Explosive properties | : No data available. |
| Oxidizing properties | : No data available. |
| Molecular Weight | : 26.04 g/mol |
| Density | : 0.0011 g/cm ³ (0.069 lb/ft ³) at 21 °C (70 °F) Note: (as vapor) |
| Specific Volume | : 0.9221 m ³ /kg (14.77 ft ³ /lb) at 21 °C (70 °F) |
| Upper flammability limit | : 83 %(V) |
| Lower flammability limit | : 2.4 %(V) |

SECTION 10: Stability and reactivity

| | |
|--------------------|---|
| Reactivity | : Refer to possibility of hazardous reactions and/or incompatible materials sections. |
| Chemical Stability | : Stable under normal conditions. |

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| Possibility of hazardous reactions | : Unstable. Stable as shipped. Do not use at pressure above 15 psig. |
| Conditions to avoid | : Cylinders should not be exposed to sudden shock or sources of heat. Heat, flames and sparks. May form explosive mixtures with air and oxidizing agents. |
| Incompatible materials | : 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. Oxygen. Oxidizing agents. |
| Hazardous decomposition products | : No data available. |

SECTION 11: Toxicological information

Information on toxicological effects

Likely routes of exposure

| | |
|--------------------|---|
| Effects on Eye | : No data available. |
| Effects on Skin | : No adverse effect. |
| Inhalation Effects | : May cause anesthetic effects. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves. |
| Ingestion Effects | : Ingestion is not considered a potential route of exposure. |
| Symptoms | : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness. |

Acute toxicity

| | |
|---------------------------|---|
| Acute Oral Toxicity | : No data is available on the product itself. |
| Inhalation | : No data is available on the product itself. |
| Acute Dermal Toxicity | : No data is available on the product itself. |
| Skin corrosion/irritation | : No data available. |
| Serious eye damage/eye | : No data available. |

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irritation

Sensitization. : No data available.

Chronic toxicity or effects from long term exposures

Carcinogenicity : No data available.

Reproductive toxicity : No data is available on the product itself.

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : No data available.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

SECTION 12: Ecological information

Toxicity

Aquatic toxicity : No data is available on the product itself.

Toxicity to other organisms : No data is available on the product itself.

Persistence and degradability

No data available.

Bioaccumulative potential

No data is available on the product itself.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

If applicable, refer to the extended section of the SDS for further information on CSA.

Other adverse effects

This product has no known eco-toxicological effects.

SECTION 13: Disposal considerations

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Waste treatment methods : Contact supplier if guidance is required. Return unused product in original cylinder to supplier. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor.

Contaminated packaging : Return cylinder to supplier.

SECTION 14: Transport information

ADR

UN/ID No. : UN1001
Proper shipping name : ACETYLENE, DISSOLVED
Class or Division : 2
Tunnel Code : (B/D)
Label(s) : 2.1
ADR/RID Hazard ID no. : 239
Marine Pollutant : No

IATA

This material is forbidden from air transport in accordance with Air Products internal company safety policy.

IMDG

UN/ID No. : UN1001
Proper shipping name : ACETYLENE, DISSOLVED
Class or Division : 2.1
Label(s) : 2.1
Marine Pollutant : No

RID

UN/ID No. : UN1001
Proper shipping name : ACETYLENE, DISSOLVED
Class or Division : 2
Label(s) : 2.1
Marine Pollutant : No

Further Information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact an Air Products customer service representative.

SECTION 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

| Country | Regulatory list | Notification |
|---------|-----------------|------------------------|
| USA | TSCA | Included on Inventory. |

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|-------------|--------|------------------------|
| EU | EINECS | Included on Inventory. |
| Canada | DSL | Included on Inventory. |
| Australia | AICS | Included on Inventory. |
| Japan | ENCS | Included on Inventory. |
| South Korea | ECL | Included on Inventory. |
| China | SEPA | Included on Inventory. |
| Philippines | PICCS | Included on Inventory. |

WGK Identification Number: : Not water endangering.

Chemical Safety Assessment

Refer to extended SDS for CSA information

SECTION 16: Other information

Ensure all national/local regulations are observed.

R-phrase(s) - Components

R 5 Heating may cause an explosion.
R 6 Explosive with or without contact with air.
R12 Extremely flammable.

Hazard Statements:

H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.

Prepared by : Air Products and Chemicals, Inc. Global EH&S Product Safety Department

For additional information, please visit our Product Stewardship web site at
<http://www.airproducts.com/productstewardship/>

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws. Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.