Acetylene, Dissolved

Safety Data Sheet

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

Product identifier

Product Name Acetylene, Dissolved

Other means of identification

Safety data sheet number **SDS-YO-001**

UN/ID no. UN1001

Trade name Acetylene, Grade B.98, Grade A.99.5

Recommended use of the chemical and restrictions on use

Recommended Use Industrial and professional use. Welding

Uses advised against Consumer use

Details of the supplier of the safety data sheet

Yateem Oxygen W.L.L
P.O. Box 60, Manama, Bahrain
Email: wecare@yateemoxygen.com
Website: www.yateemoxygen.com

Customer Service: +973 17400677

Emergency telephone number

Company Phone Number +973 17400456

Emergency Contact Number +973 17456248; +973 17400675

SECTION 2: Hazards identification

Classification

OSHA Regulatory Status This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Flammable gasses	Category 1
Gasses under pressure	Dissolve gas
Simple asphyxiants	Yes

Label elements

Signal word **Warning**

Hazard Statements

Extremely flammable gas
May react explosively even in the absence of air at elevated pressure and/or temperature
Contains gas under pressure; May explode if heated
May displace oxygen and cause rapid suffocation
May form explosive mixtures with air

Precautionary Statements - Prevention

Do not handle until all safety precautions have been read and understood
Keep away from heat, sparks, open flames hot surfaces – No smoking
Use and store only outdoors or in a well-ventilated place
Use a backflow preventive device in piping
Fusible plugs in top, bottom, valve melt at 98 ^{0}C to 107 ^{0}C (208 ^{0}F to 224 ^{0}F).
Do not discharge at pressure above 15 psi (103kPa)
Close valve after each use and when empty
Never put cylinders into unventilated areas of passenger vehicles

Precautionary Statements - Response

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical attention/advice. Leaking gas fire: do not extinguish, unless leak can be stopped safely Eliminate all ignition sources if safe to do so

Precautionary Statements - Storage

Protect from sunlight when ambient temperature exceeds 52°C/125°F

Precautionary Statements - Disposal

Dispose of contents/containers in accordance with container supplier/owner instructions

Hazards not otherwise classified (HNOC)

Supports combustion

SECTION 3: Composition/information on ingredients

Chemical Name	CAS No.	Volume %	Chemical Formula
Acetylene	74-86-2	60-100	C_2H_2
Acetone	67-64-1	5-10	C_3H_60

For safety reasons, acetylene gas is dissolved in acetone in the gas cylinder.

SECTION 4: First aid measures

Description of first aid measures

General advice Show this safety data sheet to the doctor in attendance.

Inhalation Remove to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention immediately

Skin contact Wash off immediately with soap and plenty of water. Contaminated clothing presents a fire hazard and should be removed immediately. Get medical attention if irritation develops and/or persists.

Eye contact Consult a physician if direct contact with pressurized material occurs. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek immediate medical attention/advice

Ingestion Not an expected route of exposure

Self-protection of the first aider Remove all sources of ignition. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING-APPARATUS.

Most important symptoms and effects, both acute and delayed

Symptoms Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death. Symptoms of overexposure are dizziness, headache, tiredness, nausea, unconsciousness, cessation of breathing. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

SECTION 5: Firefighting measures

Suitable extinguishing media

DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. Dry chemical. Water spray or fog.

Unsuitable extinguishing media Do not use a solid water stream as it may scatter and spread fire.

Specific extinguishing methods

If possible, stop the flow of gas. Do not extinguish the fire until supply is shut off as otherwise an explosive-ignition may occur. If the fire is extinguished and the flow of gas continues, GET AWAY!
Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Do not direct water at source of leak or safety devices; icing may occur. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Use water spray to cool surrounding containers. Be cautious of a Boiling Liquid Evaporating Vapor Explosion, BLEVE, if flame is impinging on surrounding containers. Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

Specific hazards arising from the chemical

GASEOUS ACETYLENE IS SPONTANEOUSLY COMBUSTIBLE IN AIR AT PRESSURES ABOVE 15 PSI (270 kPa). Pure acetylene is shock sensitive. 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.
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 dropped on the fusible plugs. When the fusible plug releases a large volume of acetylene creating a "roaring" sound. The flame may extend a foot or two away from the cylinder until the pressure is reduced. In most cases, the other end of the cylinder may develop a coating of frost.
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 re-ignited by adjacent ignition sources, thereby possibly creating confined space explosion. Keep containers cool with water spray.
Vapors may travel to source of ignition and flash back. Vapors from liquefied gas are initially heavier than air and spread along ground. Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.). Cylinders may rupture under extreme heat.

Hazardous combustion products Carbon monoxide. Carbon dioxide (CO_2).

Protective equipment and precautions for firefighters

Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. If the fire is extinguished and the flow of gas continues, GET AWAY!
As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Consider the risk of potentially explosive atmospheres. Monitor oxygen level. All equipment used when handling the product must be grounded. Use non-sparking tools and equipment. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Do not touch or walk through spilled material.

Other Information

Gas/vapor is heavier than air. Prevent from entering sewers, basements and work pits, or any place where accumulation may be dangerous

Environmental precautions

Environmental precautions Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Prevent spreading of vapors through sewers, ventilation systems and confined areas. See Section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Yateem Oxygen location. DO NOT ATTEMPT TO REMOVE CYLINDERS THAT HAVE BEEN EXPOSED TO HEAT.

Methods for cleaning up Return cylinder to Yateem Oxygen

SECTION 7. Handling and Storage

Precautions for safe handling

Advice on safe handling

Never use copper piping for acetylene service. Only steel or wrought iron pipe should be used. Open cylinder valve minimum amount required (no more than 1-1.5 turns) to deliver acceptable flow to enable the cylinder to be closed quickly in an emergency situation. 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 the solution and passes out in the gaseous form. IT IS CRUCIAL THAT FUSE PLUGS IN THE TOPS AND BOTTOMS OF ALL ACETYLENE CYLINDERS BE THOROUGHLY INSPECTED WHENEVER HANDLED. REMOVE AND QUARANTINE IN SAFE LOCATION ANY DEFECTIVE CYLINDER.

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground and bond all lines and equipment associated with product system. All equipment should be non-sparking and explosion proof. "NO SMOKING" signs should be posted in storage and use areas. Use equipment purged with inert gas or evacuated prior to discharge from cylinder. Avoid contact with pure copper, mercury, silver and brass with greater than 65% copper. Solvent (acetone) may accumulate in piping system. For maintenance use appropriate resistant gloves, eye goggles. Operating pressure should be limited to 15 psig (103 kPa) or less. Consider the use of flashback arrestors. 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 total capacity of 2500 ft^3 of gas, exclusive of in-use or attached for use cylinders.

Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Never attempt to lift a cylinder by its valve protection cap. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Use only with adequate ventilation. Use a backflow preventive device in piping. Use only with equipment rated for cylinder pressure. Close valve after each use and when empty. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Ensure the complete gas system has been checked for leaks before use.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

Only experienced and properly instructed persons should handle gases under pressure. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers.

For additional information, consult the Compressed Gas Association's pamphlets P-1, G-1, G-1.1, AV-9, G-1.2, G-1.3, G-1.5, G-1.6, G-1.7, C-13, SB-4, NFPA #51, and OSHA 1910 Subpart H & Q.

Conditions for safe storage, including any incompatibilities

Storage Conditions

Outside or detached storage is preferred. Do not store cylinders on their side. This makes the acetylene less stable and less safe and increases the likelihood of solvent loss resulting in decomposition. 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".

Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. 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. Stored containers should be periodically checked for general condition and leakage

Incompatible materials

Oxidizing agents. Halogenated compounds. Halogens. Copper. Silver. Mercury. Brasses containing >65% copper and brazing materials containing silver or copper.

SECTION 8: Exposure controls/personal protection

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Acetylene 74-86-2	: See Appendix F: Minimal Oxygen Content	None	Ceiling: 2500 ppm Ceiling: 2662 mg/m
Acetone 67-64-1	STEL – 750 ppm TWA – 500 ppm	TWA: 1000 ppm TWA: 2400 mg/m3 (vacated) TWA: 750 ppm (vacated) TWA: 1800 mg/m3 (vacated) STEL: 2400 mg/m3	IDLH: 2500 ppm 10% LEL TWA: 250 ppm TWA: 590 mg/m3

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health

Appropriate engineering controls

Other Information:

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Engineering Controls Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%. Explosion proof ventilation systems. Oxygen detectors should be used when asphyxiating gases may be released. Consider installation of leak detection systems in areas of use and storage. Systems under pressure should be regularly checked for leakages. Showers. Eyewash stations

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Skin and body protection Work gloves and safety shoes are recommended when handling cylinders. Wear fire/flame resistant/retardant clothing. Take precautionary measures against static discharge.

Respiratory protection Use positive pressure airline respirator with escape cylinder or self-contained breathing apparatus for oxygen-deficient atmospheres (<19.5%).

General Hygiene Considerations Handle in accordance with good industrial hygiene and safety practice.
Do not get in eyes, on skin, or on clothing

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Gas
Appearance	Colorless.
Odor	Slight garlic
Odor threshold	**NO information available**
pH	Not applicable
Melting/freezing point	-80.6 ^{0}C / -113 ^{0}F
Evaporation rate	Not applicable
Flammability (solid, gas)	Flammable gas
Lower flammability limit:	2.5%
Upper flammability limit:	82%
Flash point	Not applicable
Autoignition temperature	296 ^{0}C / -565 ^{0}F
Decomposition temperature	No data available
Water solubility	Soluble in water
Partition coefficient	No data available
Kinematic viscosity	Not applicable

Chemical Name	Molecular weight	Boiling point / range	Vapor Pressure	Vapor density (air =1)	Gas Density kg/m^3@20°C	Critical Temperature
Acetylene	26.03	-75.2 °C	4378kPa @21.1 °C	0.90	1.72	36.0 °C

SECTION 10: Stability and Reactivity

Reactivity
Forms explosive acetylides with copper, silver and mercury. Do not use alloy containing more than 65% copper

Chemical 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. Do not discharge at pressures above 15 psi (103 kPa).

Explosion data
Sensitivity to Mechanical Impact Self-decomposition /self-ignition may be triggered by heat, chemical reaction, friction or impact.
Sensitivity to Static Discharge Yes

Possibility of Hazardous Reactions
May react explosively even in absence of air at elevated pressure and/or temperature. May form explosive mixtures with air.

Hazardous polymerization Temperatures as low as 250°F (121°C) at high pressure, or at low pressure in the presence of a catalyst are sufficient to initiate a polymerization reaction. The hazard is that the polymerization normally liberates heat and may lead to ignition and decomposition of acetylene if conditions permit.

Conditions to avoid
Heat, flames and sparks

Incompatible materials
Oxidizing agents. Halogenated compounds. Halogens. Copper. Silver. Mercury. Brasses containing >65% copper and brazing materials containing silver or copper
.
Hazardous Decomposition Products
Hydrogen gas. Carbon monoxide. Carbon dioxide (CO2).

SECTION 11: Toxicological Information

Information on likely routes of exposure

Inhalation High 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. TCLo, human-inhalation of 20 pph inhaled has been shown to cause headaches and dyspnea.

Skin contact May cause skin irritation and/or dermatitis.

Eye contact May cause slight irritation

Ingestion Not an expected route of exposure.

Information on toxicological effects

Symptoms High concentrations may cause asphyxia from lack of oxygen or act as a narcotic causing central nervous system depression. Symptoms of overexposure are dizziness, headache, tiredness, nausea, unconsciousness, cessation of breathing.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation	May cause skin and eye irritation.
Serious eye damage/eye irritation	Not classified.
Irritation	Not classified.
Sensitization	Not classified.
Germ cell mutagenicity	Not classified.
Carcinogenicity	It does not contain any carcinogens or potential carcinogens listed by OSHA, IARC or NTP.
Reproductive toxicity	Not classified.
Developmental Toxicity	Not classified.
STOT - single exposure	Not classified.
STOT - repeated exposure	Not classified.
Chronic toxicity	None known
Target Organ Effects	Central Nervous system (CNS), Respiratory system.
Aspiration hazard	Not applicable.

Numerical measures of toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50	Inhalation LC50 (CGA P-20)
Acetone 67-64-1	5800 mg/kg (Rat)	170 MG/KG (Rabbit)	18892 mg/m3	-

Product Information Oral LD50 No information available Dermal LD50 No information available Inhalation LC50 No information available

Product Information

Oral LD50 No information available
Dermal LD50 No information available
Inhalation LC50 No information available

SECTION 12: Ecological Information

Ecotoxicity

No known acute aquatic toxicity.

Chemical Name	Algae/aquatic plants	Fish	Crustacea
Acetone 67-64-1		6210 - 8120: 96 h Pimephales promelas mg/L LC50 static 4.74 - 6.33: 96 h Oncorhynchus mykiss mL/L LC50 8300: 96 h Lepomis macrochirus mg/L LC50	10294 - 17704: 48 h Daphnia magna mg/L EC50 Static 12600 - 12700: 48 h Daphnia magna mg/L EC50

Persistence and degradability

Not applicable.

Bioaccumulation

Will not bioconcentrate

Chemical Name	Partition coefficient
Acetylene 74-86-2	0.32
Acetone 67-64-1	-0.24

SECTION 13. Disposal Considerations

Waste treatment methods

Disposal of wastes Do not attempt to dispose of residual 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 Yateem Oxygen for proper disposal. This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261).

SECTION 14. Transportation Information

TDG

UN/ID no. UN1001
Proper shipping name Acetylene, dissolved
Hazard Class 2.1
Description UN1001, Acetylene, Dissolved, 2.1

IATA

UN/ID no. UN1001
Proper shipping name Acetylene, dissolved
Hazard Class 2.1

ERG Code	10L
Special provision	**A1**

IMDG

UN/ID no.	UN1001
Proper shipping name	Acetylene, dissolved
Hazard Class	2.1
EmS-No.	F-D, S-U

SECTION 15. Regulatory Information

National Legislation	Complies
SEC	https://www.sce.gov.bh/en/index
MTT	http://www.transportation.gov.bh/content/caa-laws-and-regulations
OHSC	http://www.scosh.org/en/legislation/legislations#legislationContainer

International Inventories

TSC	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies

Legend

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
SEC – Specific Council of Environment
MTT – Ministry of Transport and Telecommunications
OHSC - Occupational Health and Safety Council

SECTION 16: Other Information

NFPA	**Health hazards** 0	**Flammability** 4	**Instability** 2	**Physical and Chemical Properties -**

Note: Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.

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Safety Data sheet Number	SDS-YO01

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End of Safety Data Sheet