Safety data sheet · UN 1001

Acetylene (C_2H_2)

Safety Data Sheet

By Mithillessh Garg (kigl.co.in/about/history#mithillessh-garg), Director (Gas Supply)

Acetylene (C_2H_2, CAS 74-86-2, UN 1001) is an extremely flammable gas that can decompose explosively without oxygen present. It is supplied dissolved in acetone or DMF within a porous mass. Cylinders must be kept and used upright, away from heat and ignition sources, with flashback arrestors fitted.

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UN 1001
UN number

74-86-2
CAS number

2.1 flammable gas
Transport class

≈2.5 %
Lower flammability limit

Not the governing figure
Upper flammability limit

Section 1 — Identification

Product name

Acetylene, dissolved **Synonyms:** Dissolved acetylene, DA, ethyne **Chemical formula:** C_2H_2 **CAS number:** 74-86-2 · **EC number:** 200-816-9 · **UN number:** UN

1001 **Specification:** IS 308

Identified uses

Oxy-fuel cutting, welding, brazing and flame heating; flame hardening; atomic absorption spectroscopy (ultra-high-purity grade). **Uses advised against:** Any use in equipment not rated for acetylene. Never in contact with copper or high-copper alloys.

Supplier

The Kamrup Industrial Gases Limited.

RULES THAT MATTER

GHS classification: Flammable gases, Category 1 · Gases under pressure, Dissolved gas · Chemically unstable gas, Category A.
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

Section 2 — Hazards identification

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

P377 — Leaking gas fire: do not extinguish unless the leak can be stopped safely.

P381 — Eliminate all ignition sources if safe to do so.

P403 — Store in a well-ventilated place.

The principal hazard is that acetylene can decompose explosively under pressure, heat or shock **without any oxidant present**. It is not simply a flammable gas. Asphyxiation is a secondary hazard: in an enclosed space acetylene displaces oxygen.

Section 3 — Composition

Component	CAS	Concentration
Acetylene	74-86-2	≥98 % (industrial, KIGL spec) / 99.99 % (UHP)
Acetone (solvent, industrial grade)	67-64-1	Balance, retained in porous mass
DMF (solvent, UHP grade)	68-12-2	Balance, retained in porous mass

The cylinder contains a porous mass charged with solvent. The acetylene is dissolved in that solvent, not present as free compressed gas.

Section 4 — First aid

Inhalation

Move the casualty to fresh air, keeping yourself safe — do not enter an oxygen-deficient atmosphere without breathing apparatus. If breathing has stopped, give artificial respiration. Seek medical attention.

Skin contact

Unlikely to cause injury as a gas. Rapidly escaping gas can cause cold burns — flush with tepid water, do not rub, and seek medical attention.

Eye contact

Flush with water. Seek medical attention if irritation persists.

Note for medical personnel

Acetylene is a simple asphyxiant with mild anaesthetic properties at high concentration. Treat according to symptoms.

Section 5 — Firefighting

Suitable media: Dry powder is recommended. Water spray may be used to cool cylinders from a protected position.

Specific hazards. Cylinders exposed to fire may undergo internal decomposition and can rupture, potentially some time after the external flame is out. Acetylene cylinders may require **prolonged cooling** even once the fire is extinguished.

Do not extinguish a burning gas leak unless the flow can be stopped safely — a flame is preferable to an unignited accumulation.

Advice for firefighters. Evacuate the area. Cool cylinders from a distance and behind protection. Self-contained breathing apparatus is required. A cylinder that is hot, discoloured or sooting at the valve should be treated as a potential rupture hazard.

Section 6 — Accidental release

Evacuate the area and eliminate ignition sources if it is safe to do so. Ventilate — but note that fans must be of the appropriate protection class for a flammable atmosphere. Close the cylinder valve if it can be reached safely. If a leak cannot be stopped, move the cylinder into open air away from heat, ignition sources and the public **only if safe**, then call the fire service and your supplier.

Do not attempt repairs on a cylinder or valve.

Section 7 — Handling and storage

Handling. Only trained persons. Move cylinders on a trolley, valve closed and cap fitted. Keep the system free of oil and grease. Open the valve slowly; never crack it to blow out dust. Purge air before lighting and leak-test every connection with an approved detection fluid. Fit **flashback arrestors and non-return valves** at the regulator and the torch. Do not exceed the safe withdrawal rate.

Storage. Upright, secured, in a lockable and well-ventilated store. Never in basements, occupied rooms, unventilated spaces or public areas. Segregate from oxidising gases — particularly oxygen — and from heat and ignition sources. Prevent water pooling around cylinder bases. Operate first-in, first-out. No smoking.

Never allow the cylinder to exceed **70 °C**, and never apply heat to thaw a valve or increase flow.

Section 8 — Exposure controls

Acetylene is a simple asphyxiant rather than a toxic gas; controls target flammability and oxygen displacement. Provide ventilation at high level sufficient to prevent accumulation, use electrical equipment of the correct protection class, and monitor oxygen levels in confined spaces.

Personal protection: flame-resistant clothing, leather gauntlets, safety footwear, and eye protection to the correct shade for the work.

Section 9 — Physical and

chemical properties

Property	Value	Source
Physical state	Gas — supplied as a dissolved gas	—
Appearance	Colourless	—
Odour	Garlic-like, from impurities (principally phosphine)	—
Molecular weight	26.037 g/mol	NIST
Triple point	−80.8 °C at 1.28 bar	NIST
Normal boiling point	−83.6 °C	NIST
Critical temperature	35.2 °C	NIST
Critical pressure	61.4 bar	NIST
Flammability limit — lower	**≈2.5 % (V) in air**	IS 14814 : 2023
Flammability limit — upper	**See the note below**	—
Autoignition temperature	≈305 °C	IS 14814 : 2023 cl 4.5.2
Vapour density (air = 1)	≈0.91	Calculated from molar mass, NIST Chemistry WebBook
Solubility in solvent	Highly soluble in acetone and DMF	—

The upper flammability limit is not the meaningful number for acetylene. Most fuel gases are hazardous only between a lower and an upper concentration in air. Acetylene is different: it can decompose exothermically **with no oxidant present at all**, which is why its GHS classification includes **H230 — may react explosively even in the absence of air**, and why it must be dissolved in a solvent within a porous mass rather than simply compressed. Treat any concentration as hazardous. Figures quoting an upper limit around 80 % describe only the acetylene-in-air combustion range and understate the hazard.

Acetylene does not exist as a stable liquid under normal commercial conditions.

Thermophysical constants from the NIST Chemistry WebBook (public domain). Flammability and ignition figures are standard literature values. ***All values in this section are to be confirmed against KIGL's own analytical data before sign-off*** *— this sheet describes KIGL product and should carry KIGL numbers.*

Section 10 — Stability and reactivity

Unstable

May decompose explosively under pressure, heat or mechanical shock **without an oxidant**.

Incompatible materials

copper and alloys above roughly 65 % copper, silver, mercury and their compounds — acetylene forms shock-sensitive explosive acetylides with these. Also incompatible with oxidising agents including oxygen, chlorine and other halogens.

Conditions to avoid

heat above 70 °C, pressure above the rated filling pressure, shock and vibration, and back-flow of oxygen into the acetylene system.

Section 11 — Toxicological information

Simple asphyxiant. High concentrations displace oxygen and produce headache, dizziness, incoordination and ultimately unconsciousness. Mild anaesthetic effects at very high concentration. No significant chronic toxicity is attributed to acetylene itself; impurities such as phosphine are separately hazardous and are controlled by the product specification.

Section 12 — Ecological information

Not classified as environmentally hazardous. Does not persist or bioaccumulate. Released gas disperses in air. Spent carbide lime slurry from acetylene generation is alkaline and must be handled under local effluent rules.

Section 13 — Disposal

Do not discharge into any place where accumulation could be hazardous. Return cylinders — including apparently empty ones, which always retain dissolved gas — to the supplier. Do not attempt to dispose of a cylinder as scrap.

Section 14 — Transport

UN number	UN 1001
Proper shipping name	ACETYLENE, DISSOLVED
Class	2.1 — Flammable gas
Label	Flammable gas

Transport upright and secured, valves closed, regulators removed, caps fitted, in an open or very well-ventilated vehicle. **Never** carry cylinders in an unventilated compartment, including apparently empty ones. Separate from the driver's compartment. Unload on arrival — do not use a vehicle as a store.

Section 15 — Regulatory information

- **Gas Cylinders Rules, 2016** (PESO) — design approval, filling, inspection and transport.
- **Calcium Carbide Rules, 1987** — storage and handling of the feedstock.
- **IS 308** — dissolved acetylene specification.
- **IS 7312 : 2018** — cylinders for dissolved acetylene.
- **IS 14814** — acetylene safety code.
- **IS 13497** — fusible plugs for acetylene cylinders.
- **EN ISO 3807** — acetylene cylinders, porous mass and type testing.
- **ADR 2025** — UN 1001 transport of dangerous goods.

Further detail on the acetylene standards page (kigl.co.in/standards/acetylene-safety-standards).

Section 16 — Other information

Revision 1, issued 6 August 2026.

Compiled from Indian and international standards and established literature. The information relates to acetylene as supplied and does not release the user from assessing their own installation and application.

A signed PDF copy is available on request for audit files. This HTML page is the current version.

PRODUCT	CAS NUMBER	UN NUMBER
Acetylene, dissolved	**74-86-2**	**UN 1001**
TRANSPORT CLASS	SPECIFICATION	REVISION
2.1 — Flammable gas	**IS 308**	**1 · 6 August 2026**

Also known as: Dissolved acetylene · DA · Ethyne · C_2H_2

Acetylene — frequently asked questions

Is acetylene heavier or lighter than air? +

Can acetylene explode without oxygen? +

Why does acetylene smell of garlic? +

What extinguisher should be kept near acetylene work? +

How long must a cylinder stand upright before use if it has been horizontal? +

Where do I get the signed PDF version? +

References

Bureau of Indian Standards. (2003). *Acetylene generators — Requirements* (IS 8471:2003, First Revision).

Bureau of Indian Standards. (2017). *Fusible plug for dissolved acetylene gas cylinder — Specification* (IS 13497:2017, First Revision).

Bureau of Indian Standards. (2018). *Welded and seamless steel dissolved acetylene gas cylinders — Specification* (IS 7312:2018, Third Revision).

Bureau of Indian Standards. (2023). *Acetylene — Code of safety* (IS 14814:2023, First Revision).

Bureau of Indian Standards. (2024). *Dissolved acetylene (gas) — Specification* (IS 308:2024, Fourth Revision).

Government of India. (2016). *Gas Cylinders Rules, 2016* (G.S.R. 1081(E)). Petroleum and Explosives Safety Organisation.

Linstrom, P. J., & Mallard, W. G. (Eds.). (n.d.). *NIST Chemistry WebBook* (NIST Standard Reference Database 69). National Institute of Standards and Technology.

The Kamrup Industrial Gases Limited. (2026). *Company information and manufacturer's data* [Company statement].

ENQUIRIES

Request a quotation

State the gas or equipment, the quantity or capacity, and your location. KIGL will confirm the grade, the cylinder or plant size, and whether the location can be served from Noonmati, or through the agent network.

Request a quotation (kigl.co.in/contact) | 0361-4519363

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RELATED

- Acetylene gas — the product page for dissolved acetylene → (kigl.co.in/acetylene-gas)
- Ultra-high-purity acetylene (DMF) → (kigl.co.in/ultra-high-purity-acetylene-gas)
- Flashback arrestors → (kigl.co.in/flash-back-arrestors)
- Standards governing acetylene → (kigl.co.in/standards/acetylene-safety-standards)
- Guide — handling acetylene cylinders safely → (kigl.co.in/guides/handling-acetylene-cylinders)

Last reviewed 24 October 2026.