

DESCRIPTION

Acetylene is a compressed gas that is commonly used in conjunction with compressed oxygen to fuel torches used for various tasks.

HAZARDS



MSHA Photo

Acetylene poses unique hazards based on its high flammability, instability and unique storage and transportation requirements.

Acetylene is highly unstable. High pressure or temperatures can result in decomposition that can result in fire or explosion.

Acetylene cylinders must never be transported or stored in a closed vehicle. There are several documented explosions that have occurred due to the buildup of acetylene vapors inside of a vehicle that were triggered by a spark from the vehicle's electrical system.

THE UNIQUE ACETYLENE CYLINDER

Acetylene cylinders do not contain compressed or liquefied acetylene; instead, they contain acetylene gas dissolved in acetone that is absorbed onto a porous mass within the cylinder.

The porous mass inhibits the decomposition reaction, providing time for emergency action in the event of a mishap.

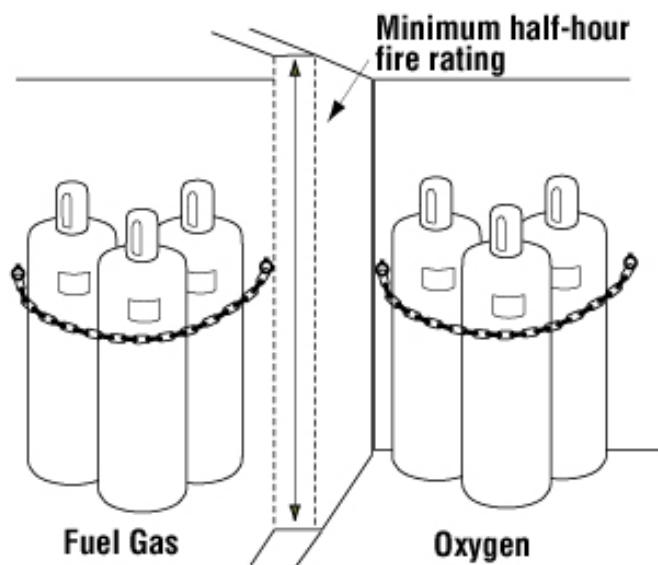
Photo - VA Tech.



ACETYLENE STORAGE

Acetylene cylinders must always be transported, stored, and used in the upright position.

Acetylene cylinders must be stored with the valve caps installed and in a well-ventilated area. Particular care must be taken with small cylinders that do not have valve protection caps. Keep cylinders away from external sources of heat. Cylinders are not designed for temperatures exceeding 125F (52C). Acetylene must be stored at least 20-feet away from oxygen or separated by a five-foot-high fire-rated wall.



Canadian Center for Occupation Health & Safety

ACETYLENE USE

Regulator Connection - Always carefully inspect the CGA connection on the cylinder and remove any visible contamination before connecting the regulator.

Leak Test - Once all components are connected, perform a leak test with a soap and water solution. Test cylinder connections, regulators, torch, and hoses.

In-Use Storage - Cylinders that have regulators installed and are considered in-use, must be properly secured on a cart or otherwise secured to prevent tipping. Cylinder valves must be closed.

Dispensing

- Avoid opening an acetylene cylinder valve without a suitable regulator and flow restriction such as a torch attached.
- The cylinder valve shall only be opened about one and one-half turns, unless otherwise specified by the manufacturer. This is to allow the valve to be quickly closed in an emergency.
- Never dispense acetylene at pressures greater than 15 psig. A violent, explosive decomposition reaction can occur.
- Acetylene regulators clearly indicate pressure at or above 15 psig with red marking on the gauge.



Flashback Prevention

There are several incidents each year where a flashback into an acetylene cylinder triggers decomposition, leaving the cylinder in a dangerous, unstable condition.

- Decomposition of acetylene is usually triggered by heat, whether the cylinder is involved in a fire, scorched by flames from a torch, or involved in a flashback.
- Before lighting the torch, purge the hoses of gas (one at a time) for a few seconds.
- Make sure the correct gas pressure and nozzle sizes are used for the work.
- Use only a spark igniter to light the gas.

- The use of flashback arrestors (shown below) and/or check valves can prevent gas from backfeeding into the hoses.



Emergency Procedures

Any Unusual Event – Close main cylinder valve.

Leaking Cylinder – For small-scale leaks in well ventilated areas, place the cylinder in a chemical fume hood or move the cylinder outdoors if it can be accomplished without using an elevator or passing through poorly ventilated areas. Once outdoors, demarcate a safe area around the cylinder and restrict access. Contact Public Safety at 511 from a campus phone or 215-573-3333 from any phone while on the main campus and 911 from all other locations.

For large-scale leaks, evacuate the area and activate the building fire alarm system.

Fire or Heat Damaged Cylinders – Any cylinders exposed to heat above 125 F may be damaged. Do not disturb cylinders and contact the gas supplier to pick them up.

Dented or Corroded Cylinders – Do not attempt to repair. Contact the gas supplier to pick them up.

Regulatory

Transfer, handling, storage, and use of acetylene in cylinders shall comply with the provisions of CGA Pamphlet G-1-2009 ("Acetylene").

Resources

[OSHA 29 CFR 1910.102](#)

[Compressed Gas Association Pamphlet G-1-2015](#)