

Acetylene

Best practices





Used mainly in welding, brazing, cutting and heating, acetylene is the most versatile and best performing fuel gas, overall.

Acetylene is a flammable gas that burns in the presence of air or other oxidizers. When mixed in certain proportions with air or oxygen it can generate an explosive atmosphere.

Did you know?

Acetylene (C_2H_2) is not an air gas but is a synthesized gas, produced mainly by the reaction of calcium carbide with water or as by-products of the petrochemical industry. In the 19th century, it was burned in acetylene lamps for lighting houses and mine tunnels. A gaseous hydrocarbon, it is colourless, with a distinctive garlic odour, unstable, highly flammable, and produces a very hot flame (more than $3000^{\circ}C$ or $5400^{\circ}F$) in the presence of oxygen.

Other applications of acetylene:

- Laboratories and analysis: used as the fuel gas in atomic absorption analyzers.
- Glass industry: used in automatic lubrication of glass bottle molds.



300 g of porous material
contains 1.3 kg of solvent
and 1 kg of acetylene

Acetylene is chemically unstable and can decompose and release a large amount of energy, even in the absence of air or oxygen, if the cylinder is heated, struck or dropped.

Close respect of these guidelines could prevent many serious accidents.

The following recommendations apply to the use of acetylene cylinders. The list is not to be considered complete, and other global recommendations concerning the risks involved in using gas cylinders in general may also be applied:

- Cylinder handling
- Cylinder storage
- Cylinder transport

Best practices on the jobsite



Your workshop or jobsite should be ...

- Clean, orderly and well ventilated
- Secured against fire risks:
 - Do not work next to combustible products or materials
 - Locate fire extinguishers before starting any work



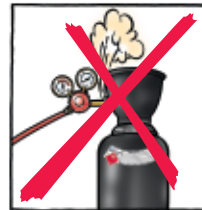
Ventilate the work area

If you smell acetylene,

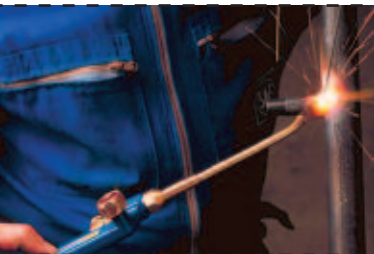
- NEVER use an open flame to check for leaks.
- Use a soap and water solution, or a commercial leak detector solution that is compatible with oxygen and acetylene, to check all equipment connections before starting work.
- NEVER use a leaking cylinder installation.
- If the cylinder leaks:
 - Close cylinder valve
 - Tag as “leaking”
 - Remove cylinder to an outdoor location and post “no smoking” sign
 - Call your gas supplier to collect the cylinder



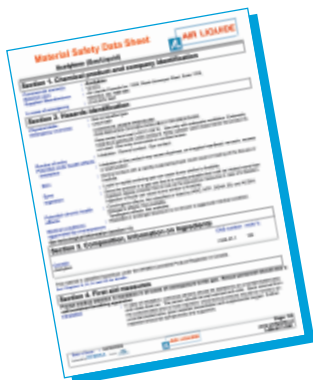
**Test for leaks with
leak detector solution**



**Never use a
leaking cylinder**



Best practices by the operator



Only trained and experienced operators should use acetylene cylinders

They must know and understand:

- Material Safety Data Sheets (MSDS)
- Proper equipment installation and operating procedures
- Specific hazards associated with the use of oxy-acetylene equipment
- Actions to take in the case of an accident

Operators must wear appropriate work apparel and corresponding personal safety accessories:

- Gloves
- Safety glasses or goggles with correct shade of lens
- Protective clothing
- Safety shoes



Wear your personal safety protection



Safety gloves



Safety glasses or goggles



Protective clothing



Safety shoes

Best practices for equipment



Your gas equipment must be:

- Identified as compatible with acetylene
- In conformance with Canadian standards (UL, CRN, CSA, etc.)
- Checked regularly and repaired or replaced when necessary (in the case of damage or expiry date).

It is recommended to install a flashback arrestor with built-in check valve in both the oxygen and the acetylene hose lines

- These safety devices should be tested frequently for leakage at the check valve and replaced after any violent flashback.



Use of these devices should not prevent you from following normal safety procedures.

Make sure there is no leak at regulator connections

- High pressure connection between the regulator and the cylinder valve outlet.
- Low pressure connection between the regulator and the welding hose.

To locate a leak and to verify the leak tightness of an equipment installation, use a suitable commercial leak detector solution that is compatible with oxygen and acetylene.

NEVER use an open flame to check for leaks.

We recommend the use of a hand-screwed connection with O-ring seal to avoid leaks at regulator outlet connections.



Always use specialized
ACETYLENE equipment



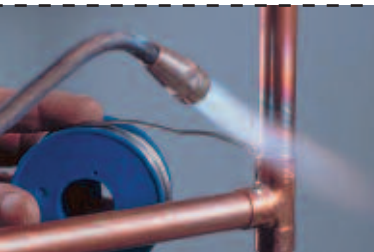
Use Grade R or Grade T hose
that conforms to RMA
standard IP-7



Use flashback arrestors with
built-in check valves



Carefully check the
connection between the
regulator and the cylinder
valve outlet



Best practices when operating equipment



Never use a cylinder in the horizontal position.



Wipe cylinder connections with a clean, lint-free cloth.



Open cylinder valves SLOWLY and stand with the valve outlet pointing away from you.



Withdrawal rate from a cylinder should be limited to 1/7 of its nominal capacity per hour to avoid solvent extraction. Manifold cylinders together where higher flowrates are required.

Before use

- Cylinders must be well secured in the vertical position.
- DO NOT “crack” acetylene cylinder valves to blow dust from the valve outlet. It could cause a fire.
- Before opening the cylinder valve, completely release the regulator pressure adjusting mechanism to “close” the regulator valve (turn counter-clockwise).
- Closely follow the manufacturer’s set-up and operating procedures. In particular:
 - Before lighting the torch, purge each gas hose separately, one at a time, for a few seconds to expel any dangerous gas mixture. After purging, close each torch valve.
 - Set the proper gas pressures for the tip size being used (see the oxy-fuel pocket guide).

During use

- Use a proper flint lighter to light the acetylene flame. NEVER use a match or cigarette to light your torch.
- Always use the equipment at the recommended operating parameters.
- NEVER bring a lighted torch near a gas cylinder.

After use

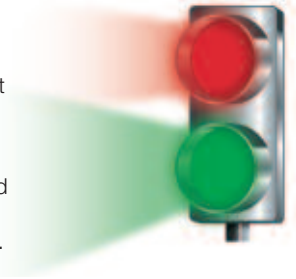
- Close both cylinder valves and release the regulator pressure adjusting mechanisms to the “closed” position.
- Drain (depressurize) each hose by opening each torch valve individually.

Best practices for storage and transportation



1. Do not store or transport gas cylinders in a non-ventilated trunk or space.
2. When transporting flammable products, always respect no smoking recommendations and have a fire extinguisher available for use.
3. Do not allow gas cylinders to remain in a non-ventilated space since any increase in temperature and/or minor leak can increase the risk of fire, explosion or asphyxia.
4. Always close cylinder valves during transport. Due to their nature, acetylene cylinders are never completely empty. Ensure that valve protection caps are in place and that regulators and other equipment are disconnected from the cylinder during transport.
5. Always ensure that gas cylinders are secured, preferably in the vertical position. A cylinder that is not properly secured can become a dangerous projectile in the case of an accident or sudden stop.
6. Take a route that is most direct – no intermediate stops. If possible, avoid routes with heavy traffic.
7. When the destination is reached, immediately remove the cylinder from the vehicle.
8. Depending on the nature and quantity of product, its transportation may be subject to the Transport of Dangerous Goods regulation in terms of:

- Shipping documentation
- Display of Dangerous Goods Safety Marks (i.e. Placards)
- Circulation on roads designated for dangerous goods
- Training on the regulation and the products transported



Safety measures in case of incident with an acetylene cylinder

In the presence of ignition or abnormal overheating of an acetylene cylinder, considering that it may explode at any time, the following measures must be taken:

- Move away from the affected cylinder.
- Never try to move the cylinder.
- Evacuate the premises immediately.
- Set up a safety perimeter.
- If necessary, ventilate the room if this can be done without endangering the operator(s), since acetylene leaks can result in an explosive atmosphere.
- Call the fire department. Remind the fire fighters of the risks incurred in the event of decomposition of the gas.

Acetylene is a standard fuel gas used in conjunction with oxygen for welding and cutting steel, and for allied processes for the heating, forming and treating of metals.



Air-acetylene flames are also used for soldering and other plumbing applications where the very high temperature of the oxy-acetylene flame is not required.



ITEM NUMBER	SIZE	VOLUME ¹		CGA CONNECTION
		m ³	scf	
GAS-ACE2COP	2	0.28	10.10	200
GAS-ACE8COP / GAS-ACE8TCOP*	8	1.10	39.67	520
GAS-ACE8MINITOP	8	1.10	39.67	023
GAS-ACE14*	14	2.08	75.01	410
GAS-ACE23 / GAS-ACE23ALTOP	23	3.60 ²	129.83	410 / 023
GAS-ACE69 / GAS-ACE69ALTOP	69	10.30 ²	371.46	410 / 023

¹ m³ @ 15°C; scf @ 70°F / ² Typical volume; actual volume may vary
* with tulip cap

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