

SAFETY ALERT



Acetylene Cylinders



A leaking gas bottle in the back of a plumber's van caused a "massive explosion" in Melbourne's south last month. The explosion destroyed a plumber's van, hurled debris through the air and severely damaged nearby houses.

No-one was injured in the explosion, which occurred after an apprentice pressed a keyless device to open the plumbing van. The two apprentices standing near the vehicle who survived were lucky that the explosion went up rather than out. The explosion was fairly significant so it's very fortunate that there were no injuries as a result of it. The blast blew windows out of nearby homes and shattered windscreens in cars. It scattered debris for up to 100 metres.

Leaking gas equipment stored in the plumbers van is being blamed for the explosion. Although the equipment was stored in a locked safe cupboard, the acetylene bottle possibly had a valve leak and filled the van with gas overnight. The remote activating the doors to unlock is assumed to have created a spark, causing the blast. Please find some pictures below:



It is important to remember that this could happen to anyone and is a very serious issue.

DESCRIPTION:

Acetylene cylinders -

- Are shorter than oxygen cylinders
- Are painted maroon (deep red) in colour
- Left-hand (i.e. reversed) thread to prevent inadvertent coupling of oxygen fittings
- Have a distinctive garlic smell
- Require minimal energy to ignite in air or oxygen
- Do not use with copper, high copper or brass alloys as copper materials form explosive compounds with Acetylene
- When burned with oxygen, acetylene produces the hottest flame of all gases (3200°C).

Oxygen cylinders -

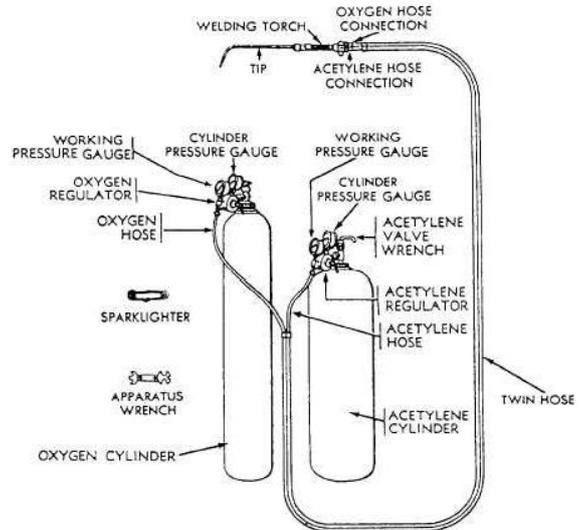
- Are taller than acetylene cylinders
- Are painted black
- Odourless
- Conventional right-hand thread
- Oxygen is compressed to a larger degree than acetylene therefore the cylinders use heavy walls and are in turn heavy.
- Oxygen fittings should be kept completely free of grease, oil or lubricants;
(if these contaminants come in contact with the oxygen, an explosion can occur)
- Oxygen is not air. Oxygen is an "accelerant", it causes everything to burn hotter and faster
- Generally considered non-toxic at atmospheric pressure
- Will not burn, but supports and accelerates combustion
- Materials not normally considered combustible may be ignited by sparks in oxygen rich atmospheres
- 30% oxygen in the atmosphere will cause things to burn or explode 8 times faster

SAFETY INFORMATION:

Acetylene is an unstable gas that can suddenly decompose in the form of a deflagration or detonation. Therefore large volumes should not be stored in piping systems and vessels and care must be taken to prevent ignition sources, including accidental heating of pipes and electrostatic sparks. Acetylene forms unstable and potentially explosive compounds with copper and silver and these materials should be excluded from acetylene piping systems. These piping systems need to be designed by specialists in that field.

PRECAUTIONS FOR USE:

- Cylinders and manifolds should be positioned in well ventilated areas, preferably outside a building with low pressure gas piped to equipment. A well maintained flashback arrestor is strongly recommended at the equipment connection and the regulator connection. Never allow oil or grease on cylinder valves. All operators must check for leaks after pressurising system and prior to starting any operation. If the indicated pressure drops, there is a leak. Avoid contact with escaping gas.
- Upon opening, open cylinder valve slowly to avoid pressure shock then close when not in use. Mechanical lifting devices and trolleys should be used to lift and move cylinders. Secure cylinders against falling at all times, especially when in use. Flash-back or burn-back in acetylene hoses is a common hazard due to acetylene's decomposition initiated by high temperatures at the welding or cutting torch head. Specialist hoses and regulators must be used. It is expected that flashbacks / flame arrestors be fitted to all bottles.



Flash back and flame arrestors:

- A flash back arrestor is a safety device commonly used to shut off the gas flow in the event of flash back. They stop the flame from burning back up into the equipment and causing damage or explosions. A flash back arrestor shuts off the gas flow and extinguishes the flame before it can reach the gas source. Several factors can cause flash back, including failing to purge line properly, using improper pressure, leaks in your gas management system and improper system operation.

STORAGE & TRANSPORT:

Transport -

Due to its instability, acetylene needs to be stored dissolved in acetone that is soaked in a mineral matrix material and compressed in special steel cylinders. Before storing or transporting the cylinders, each cylinder needs to be shut down. In order to do this, each cylinder is equipped with a shut-off valve (like a tap in your bathroom) which is rotated clockwise to close. The process for storage is as follows:

1. Close the main cylinder valves
2. Unscrew the regulator handles
3. Open blowpipe valves and release gas in hoses. **Ensure there is no source of ignition in the vicinity**
4. Close the blowpipe valves
5. Store
6. If travelling, ensure cylinder is separated from driver and that outlet of relief device is not obstructed.

Storage -

Once dismantled, do not store near sources of ignition, oxidising agents, poisons, flammable liquids or combustible materials. They must be stored:

- In an upright position
- Be prevented from falling
- In a secure area
- Below 45degrees
- In a dry, well ventilated enclosure constructed
- Away from any areas of heavy traffic and emergency exits.



As your employer we are committed to ensuring all employees are safe from injury and risks whilst at work. I would like to remind you of your obligations in creating a safe working environment by identifying any potential hazards associated with the job you are about to undertake and address them before commencing work.

Please utilise all the safety equipment and clothing that you are provided with and when necessary, do everything reasonably practicable to eliminate hazards and control risks to health and safety. If you do not feel safe, don't do it. Simply stop and phone us to discuss further.

Help us to help keep you safe at work!

Australian Standard AS 2030 SAA Gas Cylinders Code

[AS 2030.2-1996](#)

[The verification, filling, inspection, testing and maintenance of cylinders for the storage and transport of compressed gases - Cylinders for dissolved acetylene](#)

FURTHER INFORMATION

For further information please contact:

SafeWork SA

GPO Box 465

ADELAIDE SA 5001

Country Offices

Berri, Mount Gambier, Port Lincoln, Port Pirie and
Whyalla

Telephone: 1300 365 255

Website: www.safework.sa.gov.au