

Basic Safety Compressed Gas Cylinders

- Keep cylinders upright
- ALWAYS secure cylinders from falling
- When not in use, remove the regulator and replace the cap
- Do not allow cylinders to knock against each other
- Do not drop cylinders
- Keep Oxygen at least 20' from all fuel gasses, or separated by a 5' high, 30-minute rated firewall

MythBusters & Safety?

In episode 63, the MythBusters team tested the theory that a compressed gas cylinder will shoot through a block wall. They sheared the valve off an oxygen cylinder causing the cylinder to accelerate to over 30 mph almost instantly. It traveled 30', crashed through the block wall, and made a sizeable dent in the wall behind it.

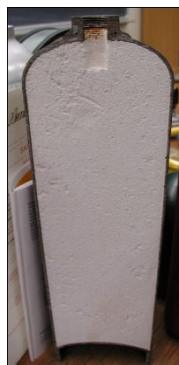


Danger!
Contents Highly. . .
Pressurized? Flammable?
Explosive?

Most people that work with acetylene know that you should never place the cylinder on its side. Have you ever wondered why?

Acetylene has an extremely high amount of chemical energy stored in its molecules that is released through combustion. When burned in the presence of oxygen (such as with an oxy-acetylene torch) it produces an intense heat that melts most metals. Due to this amount of potential chemical energy, it is extremely unstable when subjected to high pressures. It begins to break down at 15 psi posing an explosion risk, and above 29 psi the slightest bump can cause it to explode spontaneously.

Acetylene cylinders are very different from other compressed gas cylinders like argon, helium, CO₂, or Nitrogen. Those cylinders are hollow and hold the contents in a gaseous form. Acetylene cylinders are not hollow. They are filled with a porous solid, usually diatomaceous earth. Liquid acetone is added to the cylinder and is absorbed by the diatomaceous earth, and acetylene is pumped into the cylinder where it dissolves into the acetone.



Inside view of an acetylene cylinder.
Image via VA Tech EHS.
https://www.ehss.vt.edu/images/CGC_acetylene_cylinder.jpg

This acetone/acetylene solution helps to stabilize the gas for transport, and the diatomaceous earth inhibits the breakdown of acetylene which provides time for emergency response in the event of an incident.

Why then, should acetylene cylinders never be placed on their side? Placing the cylinder on its side causes the acetylene to outgas, or come out of the acetone solution. The acetylene will accumulate near the valve where it can leak from the stem when not in use. Remember, acetylene is EXTREMELY flammable.

Additionally, if used in this position, or not given enough time to settle after being uprighted, the tank can give off both acetylene and acetone at the same time quickly causing a fire and possibly exploding.

Always allow acetylene tanks enough time to settle in the upright position if they have been transported or stored on their side. Some experts recommend an hour while others recommend 24 hours; ask your employer for guidance. Never use them on their sides.

So, is acetylene dangerous due to high pressure, being extremely flammable, or explosive? The answer is all of the above.