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Why You Can't Store Oxygen With Acetylene, And Other Important Matters Regarding Compressed Gases

Ever resort to blowing on the embers when you were trying to start a campfire? Did it work? It certainly helped; you saw the embers glow more brightly with each puff of air you blew. Why? Because you were adding oxygen to the fire. Oxygen is an essential ingredient for fires. Remember the fire triangle you learned about in school? Fuel + oxygen + a spark (and the chemical reaction to get it going) = fire. You have plenty of fuel in your shop. Add a leaking oxygen cylinder, and you can have a conflagration.

Fire isn't the only hazard from cylinders of oxygen. They're under very high pressure, as much as 2200 psi. The compressed gas you use for welding, argon or argon/carbon dioxide (Stargon) is at about that same pressure. There's a lot of gas tightly packed into that cylinder. Have you ever seen what happens if a cylinder gets knocked over? It's an effective way to put a new hole in your wall. Problem is, the hole may not be where you want it. And the cylinder could hit beams, cars, or even employees if it ricochets around the shop.

Acetylene seems almost safe by comparison – maybe. The pressure in that cylinder is only about one-tenth that of the oxygen cylinder. So it isn't nearly the same pressure hazard. It is a severe fire hazard, though. That's why it is so effective for welding and cutting; combined with oxygen, it can produce a flame hotter than 5000 °F.

You don't want to have flames that hot by accident. So there are certain precautions you should take – in fact, are required by OSHA and your insurance company to take – to make sure the compressed gases you use behave themselves.

Keep oxygen away from anything that will burn: acetylene, oil, flammable liquids, cardboard scrap. It is legal to have the cylinder you're using on a cart with acetylene, because it isn't practical to separate it there. But if you have a spare cylinder, it needs to be stored at least twenty feet away from your oil tanks or your spare acetylene (the alternative is to separate them by a fire wall). A small oxygen leak, combined with your waste oil and a wayward spark, could keep the fire department busy for hours.

Never use oil or grease on any oxygen fittings. If you need a lubricant, use one specifically designed for that. Oil doesn't usually burn that easily. But oil in a high oxygen atmosphere burns very readily.

Having the gas from a full cylinder of acetylene flowing into a nearly empty oxygen cylinder is dangerous. Mark empty cylinders, so you won't have that happen. Using check valves on your torch also helps.

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It's not only the gas traveling backwards that you need to worry about. It could be a spark or flame that travels through the torch and into the gas cylinder. That's flashback. The usual causes: not using the correct pressure, not purging the gas hoses before starting, and not following the correct startup procedure. The cylinder won't blow up immediately from that – there's usually time to notice the cylinder heating up and vibrating, and then to get out and call the fire department. But there are reports of cylinders blowing up in as little as three minutes. Having a flashback arrestor on the torch (combined with following the correct procedures) is a simple preventive measure.

Cylinders can blow just from the pressure suddenly being released. It isn't fire that's the concern; it is the missile you just created when the valve stem is knocked off. So you're required to keep cylinders securely chained. And because you can't chain them until you have them in place, you need to keep the safety caps on. The only time the safety cap should come off is when you replace it with an approved regulator because the cylinder is chained and about to be used.

Handling compressed gas safely is straightforward: control the pressure hazard, control the fire hazard. As straightforward as it is, we see problems often. We see cylinders left, unsecured, in the middle of a room. Cylinders with chains too low to do any good. Oxygen stored with acetylene, or oxygen near combustibles. Accidents waiting to happen. Don't let a compressed gas accident happen in your shop. Look at how you're handling and storing these, and take corrective measures now.

This article is intended to provide general information (not advice) about current safety topics. To discuss your specific concerns and how CHESS may help, please contact CHESS at 651-481-9787 or chess@chess-safety.com.

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