

Compressed Gas/Air Quiz



QUESTION

What is the relationship or connection with compressed **GAS/AIR** and **Cylinders**”

ANSWER

Compressed gases are stored in heavy-walled metal **cylinders** designed, produced and tested for use with compressed gases. Cylinders are made in a wide variety of sizes and shapes. They range from small lecture bottles, often used for demonstration purposes, to large cylinders over 3 meters long. Cylinders for transportation must meet CSA standard CAN/CSA-B339 “Cylinders, Spheres and Tubes for the Transportation of Dangerous Goods”. This standard covers requirements for the manufacturing, inspection, testing, marking, and requalification, reheat treatment, repair, and rebuilding of cylinders, spheres, and tubes (containers) for the transportation of dangerous goods. In addition, it includes the requirements for the qualification of new designs and registration requirements.

WHY IS IT RIGHT

GENERAL PRECAUTIONS ABOUT USING AND DISCHARGING GAS CYLINDERS

1. When moving cylinders, securely fasten them to a suitable cylinder transporting device. At the site, chain or otherwise secure the cylinder in place. Remove the valve cap only after the cylinder has been safely installed then check the cylinder valve and fixture.

Remove any dirt or rust. Grit, dirt, oil or dirty water can cause gas leaks if they get into the cylinder valve or gas connection.

2. Never open a damaged valve. Contact your gas supplier for advice.
3. There are four standard types of cylinder valve outlets to prevent interchanges of gas handling equipment between incompatible gases. Use only the proper equipment for discharging a particular gas from its cylinder. Never use homemade adaptors or force connections between the cylinder valve outlet and gas handling equipment.
4. Whether a compressed gas is a liquefied, non-liquefied or dissolved gas, the gas supplier can give the best advice on the most suitable gas discharge equipment and the safest way to use it for a specific job.
5. In general, do not lubricate any cylinder valves, fittings, or regulator threads, or apply jointing compounds and tape. Use only lubricants and sealants recommended by the gas supplier.
6. Cylinders stored in cold areas may have frozen valves. Use only warm water to thaw the valve or bring the cylinder into a warm area and allow it to thaw at room temperature.
7. Use only recommended keys or handwheels to open valves. Never use longer keys or modify keys to increase their leverage. Avoid using even the correct key if it is badly worn. Do not use pipe wrenches or similar tools on handwheels. Any of these practices could easily damage the valve seat or spindle.
8. Always open valves on all gas discharge equipment slowly. Rapid opening of valves results in rapid compression of the gas in the high-pressure passages leading to the seats. The rapid compression can lead to temperatures high enough to burn out the regulator and valve seats. Many accidents involving oxidizing gases result from burned out regulator and valve seats,

usually caused by opening valves too quickly.

9. Do not use excessive force when opening cylinder valves—use no more than three quarters of a turn if possible. If a problem develops, the valve can then be closed quickly. Leave keys on cylinders when valves are open so the valve can be closed quickly in an emergency. Some cylinder valves, such as oxygen valves, have double seating. These valves should be fully opened, otherwise they may leak.
10. Do not use excessive force when opening or closing a cylinder valve. When closing, turn it just enough to stop the gas flow completely. Never force the valve shut.
11. Close cylinder valves when the cylinder is not actually in use. Do not stop the gas flow from a cylinder by just backing off on the regulator. Regulators can develop seat leaks, allowing pressure to build up in equipment attached to the regulator. Also if the cylinder valve is left open, foreign matter can enter the cylinder if the cylinder pressure drops lower than the pressure in attached equipment. Close the cylinder valve first and then close the regulator.

MORE PRECAUTIONS

Compressed air is useful in the workplace. It is also extremely dangerous. Be aware of the dangers. Know that compressed air can kill you or others if not handled properly.

Safety Tips

- Never use any more pressure than you need to perform a job.
- Never direct compressed air at yourself or any other worker, for any reason.
- Always disconnect a tool from compressed air when making adjustments or changing attachments.
- After you have finished using a tool, always turn off

the air supply and bleed off the trap line pressure. Return the tool to its proper place.

- Never point an air-powered tool at another person. This type of horseplay can have fatal results.
- Use only air from a compressor. Never use carbon dioxide, oxygen or combustible gases to power a tool.
- Always check tools and compressed air lines daily before using them and blowing out air lines, pointing the hose away from you and anyone else in the vicinity. Make sure tools and their operating parts are securely attached.
- If the air pressure can be adjusted, keep it as low as possible to allow you to do the job, while at the same time reducing the possibility of injury.
- Using appropriate personal protective equipment (PPE) is a must. PPE requirements will vary with the task being performed, but safety glasses, hearing protection, impact-resistant face protection, hardhats, safety shoes and vibration-reducing gloves are commonly used.
- Never use compressed air to blow work surfaces or clothing clean. You can easily end up firing an object into your eye or body or that of a co-worker.

General Precautions about Compressed Gas Storage

- Allow only trained, authorized people into storage areas.
- Keep the amount of compressed gases in storage as small as possible.
- Inspect storage areas regularly for any deficiencies such as damaged or leaking cylinders and poor housekeeping.
- Correct all deficiencies as soon as possible.
- Well-ventilated and dry storage areas.
- Fire-resistant and supplied with suitable firefighting equipment including sprinklers, where appropriate.
- Away from electrical circuits and ignition sources such as sparks, flames or hot surfaces.

- Accessible at all times, but away from elevators, staircases or main traffic routes where cylinders may be dangerous obstacles.
- Labelled with suitable warning signs.
- Always store full cylinders separately from empty cylinders.

WHY IS EVERYTHING ELSE WRONG

COMPRESSED AIR DANGERS

Workers have also been killed by excessive air pressure that causes pressurized containers to burst.

Three Factors

1. Compressed air is extremely forceful. Depending on its pressure, compressed air can dislodge particles. These particles are a danger since they can enter your eyes or abrade the skin. The possible damage would depend on the size, weight, shape, composition, and speed of the particles. The pressure used to remove the particles from machines and surfaces is also strong enough to blow the filings, shavings, chips and particles of metal into the eyes, ears or skin of people. Compressed air can enter the body where the skin is not present (i.e., ear, nose, rectum or any scratch or puncture in the skin, however small) and can cause damage. There have also been reports of hearing damage caused by the pressure of compressed air and by its sound.
2. The compressed air itself is also a serious hazard. On rare occasions, some of the compressed air can enter the blood stream through a break in the skin or a body opening. An air bubble in the blood stream is known medically as an embolism, a dangerous medical condition in which a blood vessel is blocked, in this case, by an air bubble. An embolism of an artery can cause coma, paralysis or death depending upon its size, duration and

location. While air embolisms are usually associated with incorrect diving procedures, they are possible with compressed air due to high pressures. While this seems improbable, the consequences of even a small quantity of air or other gas in the blood can quickly be fatal.

3. Using air to clean forces the dirt and dust particles into the air, making these contaminants airborne and creating a respiratory hazard.

Unfortunately, horseplay has been a cause of some serious workplace accidents caused by individuals not aware of the hazards of compressed air, or proper work procedures.

Thousands of debilitating and fatal injuries have occurred as a result of air hoses accidentally whipping out of control and striking workers, people unintentionally lodging nails or staples into their heads or bodies while using air tools, or having compressed air enter their bodies.

Hazards Associated With Compressed Gas Cylinders

- High pressures inside the cylinders, which may turn these vessels into missiles if a valve break.
- The risk for fire or explosion when flammable gases such as acetylene are released and an ignition source is present.
- Violent reactions when chemically unstable gases such as acetylene or 1,3-butadiene are exposed to slight temperature changes or pressure increases.
- Asphyxiation when inert gases such as nitrogen displace oxygen to levels too low to sustain life.
- The potential for severe burns when workers are exposed to corrosive gases such as ammonia.