Compressed Gas Cylinders Toolbox Talk

WHAT'S AT STAKE?

Compressed gas cylinders are a common item in many workplaces, from shops to laboratories and hospitals to restaurants and much more. Many workplaces contain compressed gas cylinders, and many other job sites involve workers using or coming into contact or proximity with compressed gas.

Compressed or liquefied gas cylinders are often used to store chemicals for industrial purposes. The compression of the chemicals allows for a large quantity of material to be stored in a relatively small space. Because cylinder contents are under high pressure (up to 2,500 pounds-per-square-inch, or psi), there can be physical and chemical hazards involved with the use of compressed gas cylinders.

WHAT'S THE DANGER?

THE PRESSURES AND RISKS OF COMPRESSED GAS

Compressed gas consists of three major groups.

- Liquefied Gases (such as anhydrous ammonia, chlorine, propane, nitrous oxide & carbon dioxide)
- Non-liquefied Gases (e.g. oxygen, nitrogen, helium & argon)
- Dissolved Gas (Acetylene is the common one)

What makes compressed gas hazardous is the pressures inside the cylinders, which can reach extremely high levels. When properly controlled, release of these pressures is a routine and safe event. Leaks and improper release, however, pose significant **Risk.**

Compressed gases also have a significant risk of fire and explosion. These come in the form of:

- Flammable Gases
- Oxidizing Gases
- Dangerously Reactive Gas

HAZARDS

Compressed gas also carries health risks (due to toxicity); inert gases reducing oxygen levels in the work environment; and risk of corrosion.

- Compressed gases can be toxic, flammable, oxidizing, corrosive, or inert. In the event of a leak, inert gases can quickly displace air in a large area creating an oxygen-deficient atmosphere, toxic gases can create poison atmospheres, and flammable or reactive gases can result in fire and exploding cylinders. In addition, there are hazards from the pressure of the gas and the physical weight of the cylinder. A gas cylinder falling over can break containers and crush feet. The cylinder can itself become a missile if the cylinder valve is broken off.
- When in proper working order, cylinders are fitted with valves and regulators to control the release of the contents. When there is a failure of the valve or when the cylinder is damaged or punctured, the pressurized contents can release violently. This sudden release can propel a cylinder up into the air 3/4 of a mile, or along the ground up to 30 miles per hour. The energy released may also cause the cylinder to spin, ricochet, or even crash through brick walls. Uncontrolled releases from gas cylinders can pose a severe physical hazard.
- The contents of compressed gas cylinders can also pose a chemical hazard if they are accidentally released. The sudden release of these materials can create fire and explosion dangers, worker exposure to toxic or poisonous gases, or even asphyxiation (suffocation) danger if the released gas displaces room air.

HOW TO PROTECT YOURSELF

SAFE PRACTICES TO PROTECT YOU FROM THE HAZARDS OF COMPRESSED GASES:

- Read the MSDSs and labels for all of the materials you work with.
- Know all of the hazards (fire/explosion, health, chemical reactivity, corrosively, pressure) of the materials you work with.
- Know which of the materials you work with compressed gases are and check the label, not the cylinder color, to identify the gas.
- Store compressed gas cylinders in cool, dry, well-ventilated areas, away from incompatible materials and ignition sources. Ensure that the storage temperature does not exceed 52°C (125°F).
- Store, handle and use compressed gas cylinders securely fastened in place in the upright position. Never roll, drag, or drop cylinders or permit them to strike each other.
- Move cylinders in handcarts or other devices designed for moving cylinders.
- Leave the cylinder valve protection cap in place until the cylinder is secured and ready for use.
- Discharge compressed gases safely using devices, such as pressure regulators, approved for the particular gas.
- Never force connections or use homemade adaptors.
- Ensure that equipment is compatible with cylinder pressure and contents.
- Carefully check all cylinder-to-equipment connections before use and periodically during use, to be sure they are tight, clean, in good condition and not leaking.
- Carefully open all valves, slowly, pointed away from you and others, using the proper tools.
- Close all valves when cylinders are not in use.
- Never tamper with safety devices in cylinders, valves or equipment.
- Do not allow flames to contact cylinders and do not strike

an electric arc on cylinders.

- Always use cylinders in cool well-ventilated areas.
- Handle “empty” cylinders safely: leave a slight positive pressure in them, close cylinder valves, disassemble equipment properly, replace cylinder valve protection caps, mark cylinders “empty” or “MT,” and store them separately from full cylinders.
- Wear the proper personal protective equipment for each of the jobs you do.
- Know how to handle emergencies such as fires, leaks or personal injury.
- Follow the health and safety rules that apply to your job.

RESPONSIBILITIES

- **Managers/Unit Heads**– Managers/Unit Heads are responsible for ensuring that adequate funds are available and budgeted for the purchase of compressed gas cylinder equipment and related supplies. They will also be responsible for identifying the employees affected by this safety policy and ensure required training is accomplished.
- **Supervisors** – Supervisors will not allow any employee who has not received the required training to handle any compressed gas cylinders. Supervisors will also note defective cylinders and tag them for repair.
- **Employees –** Employees shall comply with all applicable guidelines contained in this safety policy and procedure. They shall report any defective or damaged cylinders to their supervisor.
- **Safety Department –** Safety Department provide prompt assistance to managers/unit heads, supervisors, or others as applicable on any matter concerning this safety policy and procedure. Safety will assist in developing the required training. Safety will also work with Purchasing to ensure that all newly purchased compressed gas cylinders equipment and supplies comply with current safety regulations and this safety policy and procedure.

FINAL WORD

In most of the workplaces in our society from restaurants, stores and business operations to health, good agencies, compressed gas cylinders are commonplace. Workers in these sites are familiar in the transportation, handling and storage with compressed air. These workers are also cognizant of all the perils and risks that compressed air poses.