

Compressed Gas Cylinder (CGC) Safety

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.

Cylinders range in size from table-top lecture bottles to bottles that are almost 5 feet tall and weigh 155 pounds. 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 $\frac{3}{4}$ 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. Gases may be cryogenic, flammable, combustible, explosive, oxidizing, corrosive, toxic, poisonous or inert. 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.

In order to use compressed gas cylinders safely, workers should insure that they have the necessary training and information on the proper storage, handling, usage and disposal of gas cylinders. Workers should also read the Safety Data Sheet, SDS, on the chemical components of the gas cylinders to understand the chemical properties, required personal protective equipment, health hazards, appropriate first aid, and proper cleanup procedures.

Gas cylinders should be properly labeled with their contents. The contents should be stenciled on the cylinder or printed on a label. The color of a cylinder is not an indication of what material is in it because color coding is not standardized. When cylinders are emptied, the valve should be closed and capped and the tank should be labeled "empty."

Proper storage of gas cylinders is paramount to safety. Because unsecured cylinders can be easily knocked over, they should be secured to a stable object. Chains, straps, or cages should be used and should be fixed at approximately $\frac{2}{3}$ the height of the cylinder. Cylinders should be stored in well-ventilated areas away from other incompatible materials, sources of flame or heat, or areas where they may receive damage. Empty and full cylinders should be stored separately. To prevent the main cylinder valve from being damaged or broken, the protective cap should be kept in place whenever the cylinder is not in use.

Cylinders should not be dragged, carried, rolled, or slid across the floor. When transporting cylinders, ensure they are not able to bump into each other. To move a large cylinder, a hand truck should be used. The cylinder should be moved individually and should be secured to the hand truck with the protective cap in place at all times.

To use a gas cylinder, the valves should be cleared of any dust or dirt before attaching the regulator. Some regulators are intended for specific gases and should not be interchanged. Connection fittings should not be forced and safety devices in cylinder valves or regulators should not be altered. Cylinders should be placed with the valve accessible at all times.

When opening the valve to a cylinder, the worker should stand off to the side and open it slowly. Valves should never be left partly open—they should be opened all the way or closed. Leaking cylinders should be immediately removed from service and the work environment, if it is safe to do so. Cylinders should be serviced and refilled only by trained and authorized supply contractors.

Follow gas cylinder safety precautions and you will not crack under the pressure.

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