

fast facts

advancing safety, health, and workplace rights in the legislative branch

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Pressurized Cylinders

The Loaded Weapon in Your Workplace

If you had a potentially deadly weapon in your workplace, you'd probably keep a close eye on it. Yet, during their biennial health and safety inspections, Office of Compliance (OOC) inspectors repeatedly find hazardous pressurized cylinders unsecured and full of gases.

Potential Dangers of a Pressurized Cylinder

Pressurized cylinders, used to store various flammable and nonflammable gases, are likely to fall over if left unsecured, such as those in Figure 1. Such a fall could cause damage to the cylinder's

valve or the cylinder itself, resulting in a gas leak.

A rapid loss of pressure can turn a cylinder into an unguided missile powerful enough to break through a concrete wall. If the cylinder's gas is flammable, that power may also be accompanied by a fire or explosion.

Pressurized cylinders can result in some of the most serious violations cited by the OOC. In all its inspections, the OOC assigns a Risk Assessment Code (RAC) on a scale of 1 (most serious) to 4 (least serious) to each violation to help explain the severity of the hazard. OOC inspectors assign a RAC 1 to all unsecured cylinders with a flammable gas such as acetylene, as they carry a probable risk of catastrophic injury, physical damage, and/or death if the cylinder falls or is damaged and gas leaks. Inspectors assign a RAC 2 to unsecured cylinders that contain nonflammable gasses such as carbon dioxide or nitrogen, as there is still a probable risk of critical injury and/or physical damage if the cylinder were to be damaged and become a missile.

Properly Caring for a Pressurized Cylinder

To avoid this potential loss of property—and even human life—chain or secure all pressurized cylinders to keep them from falling. (29 CFR 1926.350 (a)(7) and 1910.253(b)(2))



Figure 1: Improperly stored cylinders

Even if the cylinder is properly stored, protect its valve like it still may fall: keep the safety cap on when the cylinder is not in use, as seen in Figure 2.

To prevent misuse of certain gases, properly label all cylinders to identify the type of gas contained inside. Do not remove or deface these labels in any way.

Additionally, you are required to inspect, hydrostatically test, and pressure test pressurized steel cylinders every five years. Test aluminum cylinders every twelve years. Note that the supplier typically conducts these tests when the cylinders are refilled.

Never store a pressurized cylinder outside or in any other place where it may rust, as this weakens the cylinder wall. A rusted cylinder can leak gas or even rupture, causing an explosion or sudden



Figure 2: Properly stored cylinders

rocketing. Cylinders stored outside can also be subjected to extreme temperatures, which can cause damage. To prevent a rapid rise in internal pressure that can cause the cylinder wall to fail, acetylene cylinders should not be stored in areas where the temperature can exceed 125 degrees Fahrenheit.

What's the Worst That Could Happen?

Figure 3 at right illustrates the potential danger of an improperly stored pressurized cylinder.

The driver of this vehicle left an acetylene cylinder with a slightly opened valve in the back seat of his vehicle over a weekend. When he opened the door on Monday morning, the result was the explosion pictured here. The leaking acetylene could have been ignited by any number of seemingly harmless factors, including the use of a mobile phone, the lighting of a cigarette, or the activation of the automatic door control or interior lights.

The vehicle's driver sustained damage to his eardrums and some facial scarring, but the consequences of his mistake could have been far more serious.



*Figure 3: Result of an improperly stored cylinder.
Image and details courtesy of the U.S. Department of Labor, Mine and Health Safety Division*

fast stats

- **The United States Department of Labor, Bureau of Labor Statistics, reported that pressurized containers caused 5,160 injuries involving days away from work and 17 deaths in 2004.**
- **The Office of Compliance 108th Congressional Biennial Safety and Health Inspections found 17 instances of unsecured compressed gas cylinders.**
- **The Code of Federal Regulations (CFR) requires all pressurized cylinders to be secured properly and fitted with safety caps when not in use. (29 CFR 1910.253(b)(2)(ii) and (iv) and 1926.350(a)(6) and (7))**
- **The National Fire Protection Association (NFPA) requires that all flammable gasses be stored a minimum of 20 feet from oxygen or be separated from oxygen by a fire-resistive partition. (NFPA 51)**



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