Gas Cylinder Storage and Handling – Quick Tips

Hundreds of different materials are packaged in compressed gas cylinders—atmospheric gases, fuel gases, refrigerant gases, poison gases, etc. The hazards associated with these gases include oxygen displacement, explosion hazards, toxic effects and the physical hazards of a ruptured cylinder. The Occupational Safety and Health Administration (OSHA) references general requirements for compressed gases in 29 Code of Federal Regulations (CFR) 1910.101 and specific gas requirements are found in:

- 29 CFR 1910.102 – Acetylene
- 29 CFR 1910.103 – Hydrogen
- 29 CFR 1910.104 – Oxygen
- 29 CFR 1910.105 – Nitrous Oxide
- 29 CFR 1910.110 – Storage and Handling of Liquefied Petroleum Gases (LPG)
- 29 CFR 1910.111 – Storage and Handling of Anhydrous Ammonia

Gas Cylinder Inspection: General Requirements

29 CFR 1910.101(a) states employers must visually inspect compressed gas cylinders to ensure that they are in a "safe condition." Visual cylinder inspections should look for leaks, bulging, defective valves, evidence of physical abuse, fire or heat damage, pitting, rusting or corrosion. If cylinders do not pass a visual inspection they need to be repaired and re-qualified per Department of Transportation (DOT) regulations.

Visual and other inspections must be conducted as described in the DOT Hazardous Materials Regulations (49 CFR 171 – 180).

Where the DOT regulations are not applicable, visual and other inspections must be conducted as prescribed in the Compressed Gas Association's (CGA) C-6 Standard for Visual Inspection of Steel Compressed Gas Cylinders (revised June 28, 2013) and C-8 Standard for Requalification of DOT-3HT, CTC-3HT and TC-3HTM Seamless Steel Cylinders (revised November 6, 2017) pamphlets.

Gas Cylinder Storage and Handling: General Requirements

Per 29 CFR 1910.101(b), the in-plant handling, storage and utilization of all compressed gas cylinders must be in accordance with CGA Pamphlet P-1 Standard for Safe Handling of Compressed Gases in Containers (revised March 23, 2015).

Gas cylinders should be properly secured at all times to prevent tipping, falling or rolling. They can be secured with straps or chains connected to a wall bracket or other fixed surface, or by use of a cylinder stand.

The gas cylinders should be stored in a cool, dry, well-ventilated, fire-resistant area that meets all applicable federal, state and local regulations.

When a gas cylinder is empty or not being used, ensure that the valve is closed, the regulator removed and the valve protector cap is secured in place.

Gas cylinders should be transported using hand trucks designed for that purpose and the cylinders should be secured so that they do not tip, fall or roll.

Appropriate lifting devices, such as cradles or nets, are required when a crane, hoist or derrick is used to transport gas cylinders. Do not use magnets or slings to lift gas cylinders. Do not use the valve protection cap for lifting a gas cylinder.

It is necessary to take precautions so that gas cylinders are not dropped or allowed to strike each other or other objects. Dropping or striking may damage the gas cylinder valve, which could turn the gas cylinder into a dangerous torpedo with the potential to destroy property and/or injure personnel.

Consult the appropriate safety data sheet (SDS) for detailed information on the chemical contained in the gas cylinder. Specific chemical handling and storage precautions will be outlined in the SDS. The SDS will also have specifications for appropriate personal protective equipment (PPE) for worker protection.

Always reference the OSHA specific requirements highlighted earlier if handling or storing Acetylene, Hydrogen, Oxygen, Nitrous Oxide, LPG, or Anhydrous Ammonia in your facility.

Commonly Asked Questions

Q: Can full and empty cylinders be stored together?

A: According to CGA P-1 pamphlet, full and empty cylinders should be stored separately to minimize handling of cylinders.

Q: Can gasoline and other flammable liquids be stored with compressed gas cylinders?

A: No. Highly flammable substances should not be stored near gas cylinders according to the CGA's p-1 pamphlet.

Sources:

OSHA 29 CFR 1910.101 Compressed gases (general requirements)
C-6 Standard for Visual Inspection of Steel Compressed Gas Cylinders, Edition 11, June 28, 2013
C-8 Standard for Requalification of DOT-3HT, CTC-3HT and TC-3HTM Seamless Steel Cylinders, Edition 8, November 6, 2017
P-1 Standard for Safe Handling of Compressed Gases in Containers, Edition 12, March 23, 2015
49 CFR Subtitle B Chapter I

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