

TerranearPMC Safety Share

Week of December 22, 2014 – Compressed Gas Cylinders

Recently, I was traveling with a fellow employee and while sitting down at an airport coffee shop, we noticed a young man that apparently worked at one of the nearby restaurants, transporting two large compressed gas cylinders down the main airport thoroughfare. Both cylinders were painted green and both were unsecured, merely resting horizontally on a small cart: one on the top shelf (about four feet high) and the other, resting on the bottom shelf (about a foot off the ground). The worker was trying to stabilize the upper cylinder with one of his hands, while pushing the cart down the airport. Meanwhile, the bottom cylinder was left to roll back and forth. Only the cart's vertical support columns prevented this cylinder from falling off. While Andy and I noticed that both cylinders were capped, the risk of the cylinders getting damaged was ever present.

Surprisingly, OSHA regulations do not specify the approved practices for transporting compressed gas cylinders, but merely reference other organizations that have developed safe practices for compressed gases. Such references are listed in 29 CFR 1910, Subpart H *Hazardous Materials*. These include the Department of Transportation (DOT) regulations; 49 CFR, parts 171-179 and the Aeronautics and Space regulations, 14 CFR, part 103. In addition, OSHA references the trade organization, the Compressed Gas Association for proper use, transportation and storage of compressed gas cylinders. As a matter of fact, many OSHA regulations rely of this organization's subject matter expertise for compressed gases including OSHA's Respiratory Protection regulation (29 CFR 1910.134) where it specifies the requirements for grade D breathing used in a self-contained breathing apparatus.

Meanwhile under OSHA's regulatory requirements for Welding, Cutting and Brazing (29 CFR 1910, Subpart Q), where compressed gases, such as oxygen and acetylene are used, OSHA does mandate safe practices of compressed gas cylinders with respect to fire safety. Such practices include:

- During transporting, moving, and storing compressed gas cylinders, valve protection caps shall be in place and secured.
- A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.
- Compressed gas cylinders shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being hoisted or carried.

Obviously, the cylinders we saw being rolled down the airport were not being transported with the best safety practices as the cylinders were not secured and not positioned in an upright position.

Nevertheless we were curious as what were the contents of the cylinders. Our first impression was that they had to be carbon dioxide (CO₂) used for soft drinks. Yet, the cylinders were color-coded green and we recently noticed CO₂ cylinders painted red in the facility where we just finished working – however these cylinders were being used for a fire suppression system. Nevertheless, the compressed gas was the same in both cases and their containers had different color coding. So what is the correct color?



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As it turns out, the primary method to identify the contents of compressed gas cylinders is the cylinder label. And while color coding of the cylinder itself, may provide a further guidance, the color of the body of the cylinder may differ for the same gas among different gas companies. Should one notice a color applied to the shoulder, or curved part at the top of the cylinder; this is only an identifier per the recently established European standard. However, in the United States, while gas cylinders are frequently seen with specific coloring, there is no regulatory requirement and is evident by the apparent inconsistencies across the various jurisdictions that are involved with compressed gases. As a result, cylinder colors cannot be used for positive product identification. For this reason, cylinders have labels to identify the gas they contain and the label alone should be used for positive identification.

Other safety precautions for compressed gas cylinders during transportation include:

- Cylinders must have the valve protection cover in place while being transported (inter and intra building transport).
- Cylinders must not be moved, rolled, or lifted by the valve or valve cap.
- Cylinders must be shut off with valve caps in place during transit from location to location.
- Cylinders that are dropped during transit must be taken out of service, labeled, and returned to the supplier for inspection.
- Cylinders must be securely supported at all times during transport.
- Smoking is prohibited during loading, unloading, and hand transportation of flammable gas cylinders

Of course there many aspects involving safe practices of compressed gas cylinders other than transportation. This include proper storage and actual use, such as keeping flammable gases away from oxidizers , and the use of reverse threading for flammable gases such as acetylene to ensure a hose dedicated for oxygen cannot be connected to an acetylene cylinder; thereby preventing a potential explosive reaction.

As it turns out, the compressed gas cylinders we saw at the airport were CO₂ and were being used for fountain drinks. Nevertheless, both Andy and I were quite surprised to see that even in our modern times of instant information along with an emphasis on community safety, such overt hazards and dangerous safety practices are still prevalent.

While not related to compressed gas safety, the picture below illustrates how even the most obvious hazard can still be ignored Talking the Talk, but not Walking the Walk....Have a very SAFE Christmas and Holiday Season!

