

# **3 - Compressed Gas: Safety Training**

EH&S – [REDACTED]

**Goals: This safety session should teach you to:**

- A. Understand the importance of following safety rules when handling compressed gases.
- B. Be aware that compressed gases are hazardous and may catch fire or explode if not handled properly—in some cases toxic fumes could also be released.
- C. Use great care in handling and storing compressed gas cylinders.

**OSHA Regulations: 29 CFR 1910.101-104, 253**

**1. OSHA has strict rules for proper, safe storage of compressed gases.**

- A. Store cylinders in a separate, dry, ventilated area at least 20 feet away from heat sources and anything flammable.
- B. Place cylinders upright on a level, fireproof floor.
- C. Fasten them securely to a wall or post with a chain or cable so they cannot be knocked over.
- D. Cylinders are heavy. Don't try to move them by hand.
- E. To move the cylinders, strap them securely to a handcart or dolly.
- F. Be careful that they don't drop or get banged or bumped.
- G. Store oxygen cylinders away from fuel/gas cylinders.
- H. Arrange your storage so the oldest cylinders will be used first.

**2. Keep valves closed and valve protection caps screwed down tightly when a cylinder is not being used.**

- A. Open valves slowly by hand. Do not use wrenches or other tools.
- B. If they won't open, notify the supplier. Don't try to force them open.
- C. Don't ever try to repair a leaky cylinder. Close the valve and take it outside away from any heat.
- D. Make sure valves are closed when a cylinder is being moved or is empty.
- E. Mark all empty cylinders with the letters "MT."
- F. Don't refill a cylinder. Return it to the vendor who is trained to refill it safely.

### 3. Different gases have different hazards.

- A. (Concentrate on the gases used in your workplace.)
  1. Oxygen doesn't burn by itself, but flammable materials burn much faster in it. It can produce spontaneous ignition in combination with other elements and compounds.
  2. Hydrogen is extremely flammable and explosive. It requires good ventilation, especially in storage.
  3. Ammonia is flammable. Inhaling a high concentration can kill—it can also cause freeze burns and eye injury. Personal protective equipment (PPE) is mandatory.
  4. Acetylene is often used in welding, but it is extremely flammable and explosive. Safe maximum pressure is 15 pounds per square inch for small-diameter piping systems.
  5. Chlorine is explosive when mixed with acetylene and exposed to light. It is explosive when combined with alcohols, ethers, and petroleum products. It will corrode iron and steel when mixed with water.
  6. Fluorine is also explosive when mixed with acetylene and exposed to light. It is corrosive, poisonous, and attacks most materials.
  7. Carbon dioxide can asphyxiate and can also be toxic when inhaled in high concentrations. It will smother petroleum, coal, and wood fires but will burn rapidly with magnesium, sodium, potassium, and metal hydrides.

### 4. Because of the different hazards involved, each cylinder must be marked clearly to identify its contents.

- A. Review the safety data sheet (SDS) to learn the hazards of each substance and rules for safe handling.
- B. The SDS will also warn you of any restrictions about exposure to heat, air, or other substances.
- C. Be sure you are wearing the PPE recommended by the SDS.
- D. Don't handle cylinders with greasy hands.
- E. Don't let oxygen spray on an oily or greasy surface or on your clothes.
- F. Always use compressed gas in a well-ventilated area away from any heat source or electrical wiring.
- G. Never smoke around any compressed gas cylinder.
- H. If you have any questions about a particular substance, ask your supervisor.

### **Summation:**

Compressed gases are very useful and, unfortunately, very hazardous substances. Make sure you know how to use them properly.