



## **ABOUT THE SAFE USE OF COMPRESSED GAS CYLINDERS**

LENGTH: 11 MINUTES

### **PROGRAM SYNOPSIS:**

Our workplace is full of hazards, hazards that can hurt us or kill us. Controlling these hazards and preventing injuries is the point of our safety and health program. One such hazard is the one presented by the unsafe handling, transportation and storage of compressed gas cylinders. Ensuring that these cylinders are handled in a safe manner can prevent injuries and save lives. That is the point of our facility's policies regarding the safe use of compressed gas cylinders and that is the point of this program. So, pay close attention as we get to the point about the safe use of compressed gas cylinders.

Topics include PPE, transporting cylinders safely, placing and securing cylinders, proper hook up, CGA fitting numbers, handling leaks and proper storage.

### **PROGRAM OBJECTIVES:**

After watching the program, the participant will be able to explain the following:

- What personal protective equipment to don when handling cylinders;
- How to transport cylinders safely;
- How to properly place and secure cylinders;
- How to achieve a proper valve connection;
- What to do if a gas leak is discovered;
- How to store cylinders properly.

### **PROGRAM OUTLINE**

#### **PERSONAL PROTECTIVE EQUIPMENT**

- Before transporting or handling a compressed gas cylinder, make it a point to put on the appropriate personal protective equipment.
- Safety glasses with side shields should be worn to protect against debris that can become airborne when valves are opened, bled or discharged.
- Leather gloves should be worn to protect your hands from injuries when handling compressed gas cylinders.
- Because a full cylinder weighs about 80 pounds, steel-toed shoes or boots are required to prevent your feet and toes from being crushed by a dropped or falling cylinder.
- In conjunction with your safety footwear, metatarsal guards are recommended to protect the fragile bones of the upper foot.
- Be aware that some cylinders contain super-cooled cryogenic liquids and some gases such as propane are often extremely cold when released.
- Goggles, a face shield and thermal gloves should be worn to prevent frostbite and burns when handling cylinders containing these types of substances.

#### **LABELS & SAFETY DATA SHEETS**

- In addition to donning the proper PPE, you should always check a cylinder's label before handling to verify its contents.
- Relying on a cylinder's color to identify its contents is a common mistake. Keep in mind that different manufacturers use different color-coding schemes.
- Make it a point to consult the Safety Data Sheet for any substance that you haven't handled before. It will provide any special handling and storage requirements as well as the specific PPE that should be worn.

#### **TRANSPORTING CYLINDERS SAFELY**

- Remember, a typical gas cylinder weighs 80 pounds, so moving and handling one carelessly often results in broken bones and other injuries.
- Before transporting a cylinder, make sure its protective cap is secured.
- The cap should always be fitted on a cylinder anytime it's not in use to protect its valve should fall or be struck by machinery or another object. Damaged valves can cause gas leaks or an improper fit of connecting devices.
- Never drag a cylinder along the ground or floor by its protective cap. Not only can the threads be damaged, the cap can suddenly detach from the cylinder and strike you in the face.
- The proper method for transporting a compressed gas cylinder is to use a specially designed hand truck, cart or dolly specifically intended for this function.
- Because heavy cylinders may be difficult to control and can be dropped easily, they should only be hand rolled short distances.
- To roll a cylinder, get a tight grip and tilt it slightly, then use a rolling motion with your hands to move it.
- Put the cylinder on the cart and then secure it before transporting it. Always fasten the safety chain or strap as tightly as possible to keep the tank stable.

- Never attempt to catch a falling cylinder. To avoid injury, get away quickly and allow the tank to hit the floor or ground.

### **PLACING & SECURING CYLINDERS**

- When you reach your destination with the cylinder, make it a point to place it in its intended location and secure it immediately.
- To accomplish this safely, move your cart as close to the destination as possible, then hand roll the tank to its proper position.
- If the intended location has a lip or edge, use small movements until you can safely tilt the cylinder in place.
- Get help from a co-worker if you have any difficulty placing the tank.
- Secure the cylinder with straps or chains once it is in place.

### **REMOVING THE SAFETY CAP & PLASTIC VALVE CAP**

- When you have the tank in place and secured properly, remove the safety cap so you can connect the cylinder to the intended operating system.
- The safety cap is threaded and must be screwed off for removal. Never use a pry bar to force off a stuck cap as this can damage the threads or valve. Use an adjustable strap wrench instead.
- Then remove the plastic cap from the valve opening if one is present.

### **PROPER HOOK UP**

- If you are connecting a regulator to adjust the pressure of the gas when released, attach it to the inlet connection and tighten it.
- When opening the valve, make it a point to stand to the side and away from the regulator face. Regulators can explode under pressure if they fail.
- Before removing a regulator from a cylinder, close the cylinder valve and bleed the pressure from the regulator.
- Be aware that various types compressed gas cylinder fittings are assigned numbers by the Compressed Gas Association, or CGA.
- To prevent incompatible gas equipment from being connected to the wrong gas supply, gas fittings are either right-hand or left-hand threaded.
- Right-hand threaded fittings are characterized by their smooth nut surfaces. Also, the designated CGA number of one of these fittings will always be an even number.
- Left-hand threaded fittings can be identified by a notched groove in the nut surface and the second digit of their CGA number is always an odd number.
- Make it a point to never attempt to force a gas connection to fit. If you are experiencing difficulty with the connection, stop and determine the source of the problem before continuing with the attachment process.
- To prevent leaks, the tank valve and its connections must be properly installed and maintained.
- Keep valves clean and remove any noticeable dirt and debris.
- Valves should be inspected before they are opened. Do not open a valve that is corroded or damaged as it may not reseal properly when you attempt to close it.
- When you have completed your work, make sure to close the valve. Valves should also be closed when a cylinder is empty or is being transported.

### **LEAKS**

- Since gas leaks are a primary safety hazard associated with compressed gas cylinders, you must take the appropriate action if you detect a leak. Notify your supervisor and follow our organization's protocols for repairing the leak or removing the tank from service.
- You can stop most valve leaks by simply tightening the connections properly using the appropriate tools.
- Should you be unable to stop a leak, follow our policy in our Emergency Action Plan to deal with the situation. Notify co-workers of the problem so they can avoid the area.
- Be aware that if health or explosion hazards are present, an evacuation of the area will be required.

### **CYLINDER STORAGE**

- It is imperative that compressed gas cylinders be stored properly to prevent worker asphyxiations, fires or explosions and overheating that can result in high-pressure ruptures.
- ISO Standard 11625 and CGA Pamphlet P-1 are the recognized authorities on the safe storage of gas cylinders. Always follow the guidelines listed in these documents when storing cylinders.
- Cylinders should be secured and stored upright with safety caps and valve outlet seals in place.
- The storage area should be specifically designated for that purpose. It should be located a safe distance from any combustible materials and be protected from the weather.
- Flammable gas cylinders should be stored separately from oxidizers, either by a wall or by a distance of 20 feet.
- Also, empty and full cylinders should be stored in separate areas.
- Open flames and smoking are prohibited in oxidizer and flammable gas storage areas.
- Make it a point to refer to section 7 of a compressed gas's Safety Data Sheet for specific information when you have questions about the proper storage of a certain substance.

# TO THE POINT ABOUT THE SAFE USE OF COMPRESSED GAS CYLINDERS

## Review Quiz

Name \_\_\_\_\_ Date \_\_\_\_\_

*Please provide answers to the following to show how well you understand the information presented during this program.*

1. Steel-toed footwear should be worn when handling compressed gas cylinders because a full cylinder weighs about \_\_\_\_\_ pounds.
  - a. 30
  - b. 50
  - c. 80
  
2. The contents of a cylinder can always be identified by the cylinder's color.
  - a. True
  - b. False
  
3. You should only hand roll a cylinder a very short distance.
  - a. True
  - b. False
  
4. You should only attempt to catch a falling cylinder if you are sure it is empty.
  - a. True
  - b. False
  
5. When you reach your destination with a cylinder, it should be placed and secured immediately.
  - a. True
  - b. False
  
6. You should never use a pry bar to force off a stuck cylinder cap.
  - a. True
  - b. False
  
7. The second digit of a left-hand fitting's CGA number will always be \_\_\_\_\_.
  - a. Even
  - b. Odd
  
8. Damaged or corroded valves should only be opened if a cylinder's contents are both nontoxic and nonflammable.
  - a. True
  - b. False
  
9. If a leaking gas from a cylinder contains health hazards or is an explosion hazard, an evacuation of the area is required.
  - a. True
  - b. False
  
10. If you have questions about the storage of a compressed gas, you should refer to \_\_\_\_\_ of its Safety Data Sheet.
  - a. Section 3
  - b. Section 7
  - c. Section 10

***ANSWERS TO THE REVIEW QUESTIONS***

1. c
2. b
3. a
4. b
5. a
6. a
7. b
8. b
9. a
10. b