Environmental, Health and Safety

COMPRESSED GAS SAFETY PROGRAM

Purpose, Application, and Scope

Wichita State University (WSU) department of Environmental Health and Safety has developed this Program to cover general procedures for the safe handling and storage of all compressed gas cylinders and provide recommended safe practices for the handling, storage, and transport of cylinders.

This Program applies to all WSU faculty and staff that use, handle, store or transport compressed gas cylinders.

Definitions

Asphyxiant gas --- A gas, usually inert, that may cause suffocation by displacing oxygen in the air necessary to sustain life or is labeled by the DOT as Division 2.2.

Compressed gas --- A gas or mixture of gases having an absolute pressure exceeding 40 psi at 70 degrees F; or a gas or mixture of gases having an absolute pressure exceeding 104 psi at 130 degrees F regardless of the pressure at 70 degrees F; or a liquid having a vapor pressure exceeding 40 psi at 100 degrees F.

Corrosive gas --- A gas that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact or is labeled by the DOT as Division 2.3 and Division 8 (Corrosive).

Cryogenic fluid --- A refrigerated liquefied gas having a boiling point colder than -90 degrees C (-130 degrees F) at 14.7 psi, or which the DOT requires the Division 2.2 label for non-flammable, non-poisonous compressed gas-including compressed gas, liquefied gas, pressurized cryogenic gas, compressene for vehicles not required

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react with other chemicals.

nable but can support and vigorously accelerate
ion source and a fuel or is labeled by the DOT as Division

- All compressed gases received, used, or stored must be labeled according to the United States Department of Transportation (DOT) and the Occupational Safety and Health Agency (OSHA) Hazard Communication regulations. Each cylinder must be marked by label or tag with the name of its contents. Such identification shall be stenciled or stamped on the cylinder or placed on a label. The primary identifier of cylinder contents is the label.
- Never rely on the color of the cylinder for identification. C

- A portable fire extinguisher (carbon dioxide or dry chemical powder type) must be available for fire emergencies where flammable gas is stored
- Spark-proof tools shall be used when working with flammable gas cylinders
- In the event of an emergency involving a flammable gas, such as a gas leak, fire, or explosion, personnel must immediately evacuate the area. Do not attempt to extinguish burning gas if the flow of product cannot be shut off immediately without risk
- All lines and equipment associated with flammable gas systems must be grounded and bonded
- Acetylene shall not be utilized in lines or hoses at a pressure exceeding 15 psi

Oxidizing Gases

Oxidizing gases are non-flammable but in the presence of an ignition source and fuel can support and vigorously accelerate combustion. Examples include Oxygen, Chlorine, Fluorine, and Nitrous oxide.

- All equipment used for oxidizing gases must be cleaned with oxygen compatible materials free from oils, greases, and other contaminants (hydrocarbons and neoprene are not oxygen-compatible; PTFE Teflon is compatible. The equipment must state that it is oxygen compatible). Do not handle the cylinder with oily hands or gloves
- Oxidizers shall be stored separately from flammable gas containers or combustible materials. A distance of 20 feet or a non-combustible barrier at least 5 feet high and having a fire rating of a least one hour is the minimum separation requirement
- Oxygen and acetylene may be stored together if it is reasonably anticipated that the gas will be used in the next 24 hours

Corrosive Gases

The following information is provided for corrosive gases. Examples include chlorine, hydrogen chloride, fluorine, hydrogen fluoride, hydrogen sulfide, carbon monoxide, and carbon dioxide.

- Keep exposure to gas as low as possible. Use fume hood or other vented enclosure when possible. Avoid contact with skin and eyes
- Wear safety goggles when handling compressed gas cylinders that contain corrosives
- An emergency shower and eyewash must be installed within 10 seconds where corrosive materials, including corrosive gases, are used
- An emergency response procedure must be in place and everyone working in the area must be trained on the procedure

Toxic and Highly Toxic Gases

In addition to the general guideline, the following measure shall be taken when handling toxic and highly toxic gases.

- Toxic and highly toxic gases shall not be stored or used outside of laboratories
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removed in the event liquid is splashed into them. Never allow an unprotected part of the body to touch uninsulated pipes or containers of cryogenic material
- Keep liquid oxygen containers, piping, and equipment clean and free of grease, oil, and organic materials
- Do not store cylinders or dewars in environmental chambers that do not have fresh air ventilation. A leak or venting from the container could cause an oxygen deficient atmosphere
- In the event of skin contact with a cryogenic liquid, do not rub skin; place the affected part of the body in a warm bath (not to exceed 105 degrees F). If a burn is significant, seek medical attention

Oxygen

Every user should understand that oxygen can be dangerous if not used correctly. Oxygen makes things burn more easily and can even explode. Following these safety guidelines will help reduce risks associated with oxygen.

- Oxygen in not compressed air, it is oxygen
- Keep oxygen tanks (cylinders) away from all heat sources, including radiators, heat ducts, stoves, fireplaces, matches, and lighters
- Do not permit open flames, sparks, or burning materials in the area where oxygen is being used
- Keep oxygen cylinders secure at all times
- Oxygen can ignite organics such as grease (without a flame)
- Never use oxygen as a substitute as a “compressed air” to run pneumatic tools, in oil heating burners, to start internal combustion engines, to blow out pipelines, or to create pressure for ventilation
- Oxygen cylinder values should be opened all of the way during use
- Do not smoke when oxygen or fuel gases are present. Smoking can cause a fire or explosion

Training

All employees affected by this policy shall be trained in compressed gas cylinder safety. The training shall include cylinder identification, inspection, handling, storage, use, and transportation.

As with any chemical, read the gas’s safety data sheet before you begin using the gas.