

Topic Outline for Compressed Gases

For the wine industry there are two main sections of the Washington Administrative Code (WAC) that apply. 296-307 for Agriculture and 296-800 for General Industry. Most wineries fall under General Industry so that is the focus of this outline.

Definition: There are three major groups of compressed gases stored in cylinders: liquefied, non-liquefied and dissolved gases.

Examples in a Winery: Use of sulfur dioxide, argon, nitrogen in barrel or cellar operations. Use of acetylene to weld repairs within the winery on equipment or tanks.

Regulatory Summary (with emphasis on application for wineries covered under general industry):

1. While compressed gasses specifically are not a common specifically cited hazard in Washington State within wineries, it is important to know that they can be extremely hazardous/dangerous if not properly stored, used, and handled.
2. DOSH provides standards for safe use of compressed gasses (WAC 296-24-295).
3. Wineries who use compressed gasses within their facility must that a written plan that addresses proper use, handling, and storage. As long as your written plan meets all the requirements under the code, it can be a section or chapter within the written Accident Prevention Program (APP).
4. All compressed gas users must have awareness level training on compressed gasses. Training should include:

Storage – There are many general storage requirements that are outlined below. Be aware that your local fire department or other authority having jurisdiction (AHJ) may also have additional requirements depending on the location of your winery and the jurisdiction that your winery resides in. The requirements of storing compressed gas may be derived from a combination of sources; including your local and state jurisdiction, the Compressed Gas Association (CGA), the International Fire Code (IFC), and the NFPA (National Fire Protection Association).

General Awareness for Persons Filling & Shipping Cylinders

- Knowledge of the types of containers gases may be shipped in
- The charging of containers as to the amount of gas and conditions for filling
- The requirements for marking and/or labeling in preparation for transportation
- The conditions under which a container may be transported

Safe Handling for Compressed Gas Cylinders

- Only cylinders meeting International Commerce Commission (ICC) should be used for the transportation of compressed gases

- Cylinders must not be charged except by the owner or with the owner's consent, only in accordance with ICC regulations, and specific [documented] procedures must be in place
- The transferring of compressed gas from larger to smaller cylinders by anyone other than the manufacturer is not recommended
- Compressed gas container must not contain gases capable of combining chemically
- Do not remove or change labels stamped onto the cylinder

Leaking Cylinder

- If the cylinder is leaking and cannot be remedied by simply tightening the valve or packing nut:
 - Remove the leaking cylinder to the outdoors
 - If the gas is toxic or flammable place appropriate signage warning against hazards
 - Notify gas supplier immediately

Labeling

- Each cylinder must be properly labeled
- Do not deface, remove any markings, labels, decals, tags, etc. attached by the supplier

Empty Cylinders – to be returned to supplier

- Close valve, replace protective cap
- Mark empty
- Store in a location separate from full cylinders

Storage

- Do not store in areas of extreme temperatures (> 125 degrees, or extremely low temps)
- Area should be prominently labeled with the names of the gases stored
- Separate incompatible gases (example – do not store flammable gases near oxidizing gases (min 20 feet separation and away from combustible materials)
- If different types of gases are stored at the same location, cylinders should be grouped by types of gas
- Store charged and empty cylinders separately; mark empty cylinders as "EMPTY"
- Store in dry, well-ventilated area
- Do not store cylinders near highly flammable substances such as oil or gasoline
- Protect the cylinders from damage
- Keep surrounding objects from falling on or into the cylinders
- If the ground is damp in the gas cylinder storage area; store off the ground to prevent rusting; store away from corrosives, fumes and salts
- Protect the cylinders against tampering from unauthorized employees

Use

- NO SMOKING around any compressed gasses!
- Should only be used/handled after being properly trained (documented)
- Never tamper with safety relief valves
- Never attempt to repair or alter cylinders, valves, or safety relief devices
- Never use cylinders for anything other than its original purpose
- Keep valve closed at all times, except when in use
- Protect cylinders from becoming part of an electrical circuit
- Never apply heat or flame/spark to a compressed gas cylinder (protect from flying sparks/welding/cutting/brazing operations)
- Do not repaint cylinders
- Questions about handling the gas cylinder or its contents – consult the cylinder manufacturer or the supplier of the gas
- User should check/verify the contents of the cylinder prior to using (not marked or no label – do not use!)
- Prior to use make sure the cylinder is secure to prevent the cylinder from being tipped over
- Do not tamper with, modify, or repair pressure regulating device – if damaged contact gas supplier immediately
- Never force connections that do not fit
- When a manifold is used – it must be designed and constructed for intended purpose
- Regulators, gauges, and hoses must be chemically compatible with the intended material
- Open cylinder valve slowly – away from yourself and other people. Never use tools not approved by the manufacture. If the cylinder is difficult to open contact the supplier.
- Never use gases other than for the intended use
- Prior to use, verify hoses/connections/cylinder are in good condition
- If the valve becomes difficult to close or is difficult to open when received from the supplier (cannot be done by hand) do not use and return the cylinder to the supplier. Do not attempt to repair cylinder valves.

Moving/Transporting Cylinders

- Storage caps shall be used during moving or transporting gas cylinders (shall be in place at all times except when in use)
- Slings, ropes, or chains should not be used to move cylinders unless provisions have been made on the cylinder for the appropriate lifting attachments
- Avoid dragging or sliding gas cylinders
- Use a suitable hand truck, or forklift (with cage and cylinders secured within the cage), FIRMLY SECURED

- During handling do not ever drop or allow the cylinders to strike each other, no rough handling, knocks, or drops that could damage the cylinder or other safety devices that could result in a leak.

Hazard Specific – *Flammable*; example acetylene for welding, butane or propane

- Do not store cylinders near highly flammable solvents, unprotected electrical connections, gas flames, or other sources of ignition
- Cylinders containing flammable materials must be stored at least 20 feet apart or in between a fire resistant partition of a rating of at least one half hour and stored away from compressed cylinders that are considered oxidizers

Hazard Specific – *Poison*; example Sulfur Dioxide

- Gas masks specific for hazard must be readily available for immediate use [**note** – there are additional requirements on the use of respirators]
- Poisonous gases must be used in areas of forced ventilation or outside
- Order/obtain the size of cylinder that will be used in a reasonable amount of time

Hazard Specific – *Pressurized Liquids*; example Oxygen, Nitrogen, Argon (maintained at extremely low temperatures)

- Transport, used, stored in the upright position
- Cylinders must be kept upright – cylinder will vent periodically to maintain proper internal pressure

Best Management Practices

- If you use carbon dioxide to produce dry ice, ensure proper personal protective equipment is utilized. At a minimum this should include cryogenic gloves and ANSI approved safety glasses.
- Receiving/inspecting gas cylinders - verify they are free from defect (confirm the cylinder is free from dents, the cylinder valve, couplings and regulators are not damaged). If any damage is present – do not use! Return to gas supplier.
- Proper storage: Commonly 2 chains or straps are used to secure the cylinder to a wall or cradle
- If a special wrench is required to activate the flow (specific to that gas cylinder) it must be left in place while in use so the flow of gas can be turned off quickly in the event of an emergency.
- If there is an emergency with a gas cylinder or the contents of a gas cylinder; notify the 911 operator of the nature of the emergency. They will likely dispatch the local hazardous materials team (if one exists).
- Follow Compressed Gas Association document P-1-2008

5. Separate downloadable documents are provided at the following links and under the Winery Safety tab at www.winerywise.com:

- **Safe Handling of Compressed Gas; Provided by the Compressed Gas Association (L&I approved)**
http://archive.org/stream/gov.law.cga.p-1.1965/cga.p-1.1965_djvu.txt
- **Hotwork - Cutting/Brazing/Welding WAC 296-24-680-722**
<http://www.lni.wa.gov/WISHA/Rules/generalsafety/PDFs/24-Part-i.pdf>
- **Compressed Gas Association P-1-2008 (at local L&I office for review; cannot be removed from L&I office. Can be purchased from the Compressed Gas Association directly)**
- **Compressed Gases WAC 296-24-29305 [Compressed Gases Summary for Wineries.docx](#)**