

GAS & CRYOGEN PIPING

INTRO

Compressed gas cylinders must be handled with caution at all times. Assume all cylinders contain gas under pressure and treat all gases as hazardous chemicals. When using gas or cryogenics, wear closed-toe shoes and safety glasses as a minimum and tailor personal protective equipment to each hazard.

GAS PIPING SYSTEMS – GENERAL REQUIREMENTS

Piping can suffer pressure changes depending on the ambient temperature resulting in an over-pressurization which requires a pressure relief device.

Pipes must be labeled in accordance with ASME A13.1 to include the content name and the direction of flow not less than every 20 feet, and at each valve, change of direction, and where it penetrates a wall or floor/ceiling assembly.

Piping systems should include zone shut-off valves, point-of-use valves, regulators and pressure relief valves to venting lines between regulators and shut-off valves.

Do NOT use copper fittings and tubing on acetylene tanks.

GUIDELINES FOR PERMANENT PIPING SYSTEMS

- Many gas systems require a permit from the city or county prior to installation.
- The systems must be installed by qualified personnel.
- Piping must be of durable and heat resistant materials compatible with the material. This may include steel, copper and stainless steel tubing/pipe.
- Fuel gas Grade T flexible gas tubing with appropriate hose clamps must be used for all petroleum-based products.

MINIMUM GUIDELINES FOR TEMPORARY PIPING SYSTEMS

Temporary gas piping systems may be used for short term experimental process development, but it must meet the following conditions:

- Piping/tubing runs should be as short as possible.
- Piping should be visible (i.e., not hidden within walls).
- It must be appropriately labeled with the material and direction (tape may be used if writing is legible).
- Piping may not serve other rooms; only local use.
- Piping material must be compatible with gas; appropriate plastic and soft copper tubing may be acceptable depending on the material.
- Regulator must step down pressure significantly for piping system.
- Tubing/piping may not be charged (pressurized) when unattended.
- Only experienced lab staff should operate the system.
- The high pressure in cylinders (4.4 to 6,000 psig) makes the gas cylinder a potential rocket with enough energy to punch through walls.
- Flammability is a concern especially with the gases acetylene, hydrogen, and propane.



For questions about gas piping, contact EH&S at 206.543.7262.