

**WAC 296-24-68207 Service piping systems. (1) Materials and design.** (a) Piping and fittings must comply with Section 2, Industrial Gas and Air Piping Systems, of the American National Standard Code for Pressure Piping, ANSI B 31.1-1967, insofar as it does not conflict with WAC 296-24-68207 (1)(b) and (c).

(b) Pipe must be at least Schedule 40 and fittings must be at least standard weight in sizes up to and including 6-inch nominal.

(c) Copper tubing must be Types K or L in accordance with the Standard Specification for Seamless Copper Water Tube, ASTM B88-66a.

(d) Piping must be steel, wrought iron, brass or copper pipe, or seamless copper, brass or stainless steel tubing, except as provided in WAC 296-24-68207 (1)(e), (f), (g), (h) and (i).

(e) Oxygen piping and fittings at pressures in excess of 700 p.s.i.g., must be stainless steel or copper alloys.

(f) Hose connections and hose complying with WAC 296-24-68209(5) may be used to connect the outlet of a manifold pressure regulator to piping providing the working pressure of the piping is 250 p.s.i.g. or less and the length of the hose does not exceed 5 feet. Hose must have a minimum bursting pressure of 1,000 p.s.i.g.

(g) When oxygen is supplied to a service piping system from a low-pressure oxygen manifold without an intervening pressure regulating device, the piping system must have a minimum design pressure of 250 p.s.i.g. You must use a pressure regulating device at each station outlet when the connected equipment is for use at pressures less than 250 p.s.i.g.

(h) Piping for acetylene or acetylenic compounds must be steel or wrought iron.

(i) You must not use unalloyed copper for acetylene or acetylenic compounds except in listed equipment.

**(2) Piping joints.**

(a) You must weld, thread, or flange joints in steel or wrought iron piping. Fittings, such as ells, tees, couplings, and unions, may be rolled, forged or cast steel, malleable iron or nodular iron. Gray or white cast iron fittings are prohibited.

(b) You must weld, braze, thread, or flange joints in brass or copper pipe. If of the socket type, you must braze them with silver-brazing alloy or similar high melting point (not less than 800°F) filler metal.

(c) Joints in seamless copper, brass, or stainless steel tubing must be approved gas tubing fittings or you must braze the joints. If of the socket type, they shall be brazed with silver-brazing alloy or similar high melting point (not less than 800°F) filler metal.

**(3) Installation.**

(a) You must install and maintain distribution lines in a safe operating condition.

(b) Piping located inside or outside of buildings may be placed above or below ground. You must run all piping as directly as practicable, protected against physical damage, proper allowance being made for expansion and contraction, jarring and vibration. You must locate pipe laid underground in earth below the frost line and protected against corrosion. After assembly, you must thoroughly blow out piping with air or nitrogen to remove foreign materials. For oxygen piping, you must use only oil-free air, oil-free nitrogen, or oil-free carbon dioxide.

(c) You must install only piping which has been welded or brazed in tunnels, trenches or ducts. Shutoff valves must be located outside such conduits. Oxygen piping may be placed in the same tunnel, trench

or duct with fuel-gas pipelines, provided there is good natural or forced ventilation.

(d) You must drain low points in piping carrying moist gas into drip pots constructed so as to permit pumping or draining out the condensate at necessary intervals. You must install drain valves for this purpose having outlets normally closed with screw caps or plugs. You must not use any open end valves or petcocks, except that in drips located out of doors, underground, and not readily accessible, valves may be used at such points if they are equipped with means to secure them in the closed position. You must case or jacket pipes leading to the surface of the ground where necessary to prevent loosening or breaking.

(e) You must provide gas cocks or valves for all buildings at points where they will be readily accessible for shutting off the gas supply to these buildings in any emergency. Underground valve boxes or manholes should be avoided wherever possible. You must also provide a shutoff valve in the discharge line from the generator, gas holder, manifold or other source of supply.

(f) You must not install shutoff valves in safety relief lines in such a manner that the safety relief device can be rendered ineffective.

(g) You must examine fittings and lengths of pipe internally before assembly and, if necessary, freed from scale or dirt. You must wash out oxygen piping and fittings with a suitable solution which will effectively remove grease and dirt but will not react with oxygen.

Note: Hot water solutions of caustic soda or trisodium phosphate are effective cleaning agents for this purpose.

(h) You must thoroughly blow out piping after assembly to remove foreign materials. For oxygen piping, you must use oil-free air, oil-free nitrogen, or oil-free carbon dioxide. For other piping, air or inert gas may be used.

(i) When flammable gas lines or other parts of equipment are being purged of air or gas, you must not permit open lights or other sources of ignition near uncapped openings.

(j) You must not perform any welding or cutting on an acetylene or oxygen pipeline, including the attachment of hangers or supports, until the line has been purged. You must use only oil-free air, oil-free nitrogen, or oil-free carbon dioxide to purge oxygen lines.

(4) **Painting and signs.**

(a) You must cover or paint underground pipe and tubing and outdoor ferrous pipe and tubing with a suitable material for protection against corrosion.

(b) You must mark aboveground piping systems in accordance with the American National Standard Scheme for the Identification of Piping Systems, ANSI A 13.1-1956.

(c) You must mark station outlets to indicate the name of the gas.

(5) **Testing.**

(a) You must test piping systems and prove them to be gastight at 1 1/2 times the maximum operating pressure, and you must thoroughly purge them of air before being placed in service. The material used for testing oxygen lines must be oil free and noncombustible. You must not use flames to detect leaks.

(b) When flammable gas lines or other parts of equipment are being purged of air or gas, you must not permit sources of ignition near uncapped openings.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 15-24-100, § 296-24-68207, filed 12/1/15, effective 1/5/16; Order 73-5, § 296-24-68207, filed 5/9/73 and Order 73-4, § 296-24-68207, filed 5/7/73.]