

Buried piping that will be subject to surface loads shall be buried at a depth that will protect the piping and its enclosure from excessive stresses. [NFPA 99:5.1.10.10.5.4]

The minimum backfilled cover above the top of the pipe or its enclosure for buried piping outside of buildings shall be 90cm (36 in.), except that the minimum cover shall be permitted to be reduced to 46cm (18 in.) where physical damage is otherwise prevented. [NFPA 99:5.1.10.10.5.5]

Trenches shall be excavated so that the pipe enclosure has firm, substantially continuous bearing on the bottom of the trench. [NFPA 99:5.1.10.10.5.6]

Backfill shall be clean and compacted so as to protect and uniformly support the pipe or its enclosure. [NFPA 99:5.1.10.10.5.7]

A continuous tape or marker placed immediately above the enclosure shall clearly identify the pipeline by specific name. [NFPA 99:5.1.10.10.5.8]

A continuous warning means shall also be provided above the pipeline at approximately one-half the depth of bury. [NFPA 99:5.1.10.10.5.9]

Where underground piping is installed through a wall sleeve, the ends of the sleeve shall be sealed to prevent the entrance of groundwater into the building. [NFPA 99:5.1.10.10.5.10]

**1317.4** Hose and flexible connectors, both metallic and nonmetallic, shall be no longer than necessary and shall not penetrate or be concealed in walls, floors, ceilings, or partitions. Flexible connectors, metallic or nonmetallic, shall have a minimum burst pressure, with a gauge pressure of 69bar (1,000 psi). [NFPA 99:5.1.10.10.7.1 - 5.1.10.10.7.2]

**1317.5** Where a positive-pressure medical gas-piping distribution system, originally used or constructed for the use at one pressure and for one gas, is converted for operation at another pressure or for another gas, the provisions of Section 1317.0 shall apply as if the system were new. [NFPA 99:5.1.10.10.10.1]

A vacuum system shall not be permitted to be converted for use as a gas system. [NFPA 99:5.1.10.10.10.2]

**1317.6** Piping exposed in corridors and other areas where subject to physical damage from the movement of carts, stretchers, portable equipment, or vehicles shall be protected. [NFPA 99:5.1.10.10.2.1]

**1317.7** Piping shall be supported from the building structure in accordance with MSS Standard Practice SP-69, *Piping Hangers and Supports - Selection and Application* or equivalent International Standard(s) approved by the Authority Having Jurisdiction. [NFPA 99:5.1.10.10.4.1]

Hangers and supports shall comply with MSS Standard Practice SP-58, *Pipe Hangers and Supports - Materials, Design, and Manufacture* or equivalent International Standard(s) approved by the Authority Having Jurisdiction. [NFPA 99:5.1.10.10.4.2]

Hangers for copper tube shall have a copper finish and be sized for copper tube. [NFPA 99:5.1.10.10.4.3]

In potentially damp locations, copper tube hangers or supports that are in contact with the tube shall be plastic-coated or otherwise be insulated from the tube. [NFPA 99:5.1.10.10.4.4]

Maximum support spacing shall be in accordance with Table 13-7.

**1317.8** Where required, medical gas and vacuum piping shall be seismically restrained against earthquakes in accordance with the applicable building code. Seismic considerations shall conform to the requirements of this code and the Authority Having Jurisdiction. [NFPA 99:5.1.10.10.4.6]

**1317.9** Two or more medical gas-piping systems shall not be interconnected for testing or any other reason. Leak testing shall be accomplished by separately charging and testing the individual piping system. [NFPA 99:5.1.10.10.8.1 - 5.1.10.10.8.2]

**1317.10** Piping shall be labeled by stenciling or adhesive markers that identify the patient medical gas, the support gas, or vacuum system, and include:

- (1) The name of the gas/vacuum system or the chemical symbol per Table 13-1.
- (2) The gas or vacuum system color code per Table 13-1.
- (3) Where positive-pressure gas piping systems operate at pressures other than the standard gauge pressure in Table 13-1, the pipe labeling shall include the operating pressure in addition to the name of the gas. [NFPA 99:5.1.11.1.1]

### **1318.0 Joints.**

This section sets forth the requirements for pipe joint installation for positive-pressure medical gas systems.

**1318.1** Brazed joints shall be made using a brazing alloy that exhibits a melting temperature in excess of 538°C (1,000°F) to retain the integrity of the piping system in the event of fire exposure. [NFPA 99:5.1.10.5.1.1]

Brazed tube joints shall be the socket type. [NFPA 99:5.1.10.5.1.2]

Filler metals shall bond with and be metallurgically compatible with the base metals being joined. [NFPA 99:5.1.10.5.1.3]

Filler metals shall comply with AWS A.5.8, *Specification for Brazing Filler Metal* or equivalent Interna-