

**2.2.2 Expansion And Contraction**

Thermal expansion and contraction of plastic drain waste and vent systems shall be taken into consideration. Thermal expansion and contraction may be controlled by several methods: offset, expansion joints, or restraints. Regardless of method utilized, certain conditions shall be met.

- (a) Support, but do not rigidly restrain piping at changes of direction.
- (b) Do not anchor pipe rigidly in walls.
- (c) Holes through framing members must be adequately sized to allow for free movement.

DWV installations with frequent changes in direction will compensate for thermal expansion and contraction. Expansion joints may be utilized in vertical straight runs in excess of thirty (30) feet (9,144 mm) provided they are installed per manufacturer's installation instructions.

Except piping buried below ground, horizontal and vertical piping should be installed with restraint fittings or a minimum twenty-four (24) inches (610 mm) 45° offset every thirty (30) feet (9144 mm).

Thermal expansion for installations subject to temperature changes may be determined from Table 1. The linear expansion shown is independent of the diameter of the pipe. [UPC 313.0]

**2.2.3 Exposed Piping**

Piping shall not be exposed to direct sunlight. Exception: Vent piping through roof. Plumbing vents through roof, exposed to sunlight, shall be protected by water base synthetic latex paints. Adequate support shall be provided where ABS piping is exposed to wind, snow, and ice loading.

**2.2.4 Protection From Damage**

Piping passing through wood studs or plates shall be protected from puncture by steel nail plates not less than 18 gauge. Piping shall be protected from concrete form oil. [UPC 313.9]

**2.2.5 Anti-Freeze Protection**

Anti-Freeze Protection – ABS pipe and traps can be protected from freezing by the use of one of the following solutions or mixtures:

- (a) 4 quarts (3.8 liters) of water mixed with 5 quarts (4.8 liters) of glycerol

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- (b) 2-1/2 lbs. (1.1 kg) of magnesium chloride dissolved in one gallon (3.8 liters) of water

- (c) 3 lbs. (1.4 kg) of table salt dissolved in one gallon (3.8 liters) of water.

The salt solutions are effective to approximately 10°F (-12°C). If lower temperatures are anticipated, the pipe should be drained or the glycerol solution should be used. [UPC 313.6]

**2.2.6 Piping Installed in Fire Resistive Construction**

All piping penetrations of fire resistance rated walls, partitions, floors, floor/ceiling assemblies, roof/ceiling assemblies, or shaft enclosures shall be protected in accordance with the requirements of the Building Code, IAPMO Installation Standards and Chapter 15 "Firestop Protection for DWV and Stormwater Applications". [UPC 313.7]

**2.3 Hangers and Supports****2.3.1 Abrasion**

Hangers and straps shall not compress, distort, cut, or abrade the piping and shall allow free movement of pipe. Pipe exposed to damage by sharp surfaces shall be protected. [UPC 314.0]

**2.3.2 Support**

Support all piping at intervals of not more than four (4) feet (1,219 mm), at end of branches, and at change of direction or elevation. Supports shall allow free movement, but shall restrict upward movement of lateral runs so as not to create reverse grade. Vertical piping shall be supported at each story or floor level. Alignment of vertical piping shall be maintained between floors with the use of a mid-story guide. Support trap arms in excess of three (3) feet (914 mm) in length as close as possible to the trap. Closet rings shall be securely fastened with corrosive resistant fasteners to the floor with the top surface one-quarter (1/4) inch (6.4 mm) above the finish floor. [UPC 314.0]

**2.4 Traps****2.4.1 Connection to Traps**

Traps shall be connected by means of listed trap adapters. [UPC 1003.0]

**2.5 Joints****2.5.1 Caulked Joints**

Make connections or transitions to bell-and-spigot cast iron soil pipe and fittings, and to bell-and-spigot pipe and fittings of other materials with listed mechanical compression joints designed for this use,