This document supersedes TB-048 *Water Velocity Recommendations*.

Domestic Cold Water

- Max. velocity of 10 ft/s (3.0 m/s) through PEX tubing.
- Max. operating pressure of 80 psig (550 kPa).

Domestic Hot Water

- Max. velocity of 8 ft/s (2.4 m/s) through PEX tubing.
- Max. operating temperature of 200°F (93.3°C).
- Max. operating pressure of 80 psig (550 kPa).

Domestic Hot Water Recirculation

The system should be sized according to the American Society of Plumbing Engineers (ASPE) method described in "Hot Water Circulation Systems" in *Plumbing Engineering Design Handbook – Volume 2*, Chapter 6 – Domestic Water Heating Systems.

- Max. velocity of 2 ft/s (0.6 m/s) through PEX tubing.
- Max. operating temperature of 140°F (60°C).
- Max. operating pressure of 80 psig (550 kPa).

Please see INFO 37 *Domestic Hot Water Recirculation* for more details.

Notes

- The flow velocities account for the increased velocities through the fittings.
- Check with your local code for water velocity restrictions.

Excerpts from model plumbing codes with respect to water pressure:

International Plumbing Code

604.8 Water pressure-reducing valve or regulator.

> Where water pressure within a building exceeds 80 psi (550 kPa) static, an approved water pressure-reducing valve ... shall be installed to reduce the pressure in the building water distribution piping to not greater than 80 psi (552 kPa) static.

Uniform Plumbing Code

608.2 Excessive Water Pressure

> Where static water pressure in the water supply piping is exceeding 80 psi (552 kPa), an approved-type pressure regulator ... shall be installed and the static pressure reduced to 80 psi (552 kPa) or less.

National Plumbing Code of Canada

2.6.3.3. Static Pressure

> 1) Where the static pressure at any *fixture* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.

Excerpts from model plumbing codes with respect to velocity:

Uniform Plumbing Code

610.12 Sizing for Velocity.

> Water piping systems shall not exceed the maximum velocities listed in this section or Appendix A.

A 107.1 Velocities.

> Velocities shall not exceed 10 feet per second (ft/s) (3 m/s), except as otherwise approved by the Authority Having Jurisdiction.

I 10.6.3 Flow velocities through the water distribution system, used for calculating flush tank and flush valve fixture units...shall not exceed

> (a) 3.0 m/s (10 ft/s) for cold-water distribution systems; and
>
> (b) 2.4 m/s (8 ft/s) for hot-water distributon systems.
>
> Note: The flow velocities in Items (a) and (b) account for the increased velocities through the fittings.

I 10.6.4 Hot-water recirculation systems shall ... have flow velocities that do not exceed 0.6 m/s (2 ft/s) ...

National Plumbing Code of Canada

2.6.3.5. Velocity

> 1) The maximum permitted water velocities shall be those recommended by the pipe and fitting manufacturer.

For more information, see:

- Plastics Pipe Institute TN-53, *Guide to Chlorine Resistance Ratings of PEX Pipes and Tubing for Potable Water Applications*.
- IAPMO IS 31, *Installation Standard for PEX Tubing Systems for Hot- and Cold-water Distribution*.
- *International Plumbing Code*
- *International Energy Conservation Code*
- *Uniform Plumbing Code*
- *National Plumbing Code of Canada*
- *National Energy Code of Canada for Buildings*
- HeatLink L3235, *PEX-a Potable Water Press System Installation Guide*.
- HeatLink L3240, *F1960 PEX-a Potable Water Expansion System Installation Guide*.
- HeatLink L2337, *INFO 37 Domestic Hot Water Recirculation Systems*.

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