
TECHNICAL BULLETIN TB229

CHLORINE RESISTANCE

Product: MUNICIPEX[®] Crosslinked Polyethylene Pipe

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ASTM F876, "Standard Specification for Crosslinked Polyethylene (PEX) Tubing" requires that all PEX pipes intended for use with potable water have a minimum extrapolated test lifetime of 50 years when tested in accordance with ASTM F2023: "Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water."

These test conditions use water with free chlorine of 4.3 +/- 0.3 parts per million (ppm – equivalent to 4.3 mg/L) and pH of 6.8 +/- 0.2, and/or with a minimum oxidative reduction potential (ORP) of 825 mV. This is an extremely aggressive water quality based on theoretical factors. This test procedure is designed to extrapolate the life expectancy of a hot-water plumbing pipe when used at temperature of 140°F (60°C) and pressure of 80 psi (550 kPa).

Note: The Environmental Protection Agency (EPA) sets a maximum chlorine level of 4.0 ppm within the water distribution system. A 1996 survey by the American Water Works Association (AWWA) of more than 500 large US water utilities reported an average chlorine level of 1.1 ppm (leaving the treatment plant) and an average pH value of 7.7. Canadian data is similar.

REHAU's MUNICIPEX PEXa crosslinked polyethylene water service pipe has been tested by NSF International in accordance with ASTM F2023. MUNICIPEX pipe was shown to exceed the minimum extrapolated test lifetime of 50 years. Results are certified by NSF and the Plastics Pipe Institute. Based on these positive test results, REHAU continues to recommend MUNICIPEX plumbing pipe for potable water plumbing applications where the following water quality conditions are met:

- The pH of the water is 7.0 or higher
- The concentration of free chlorine is 4.0 parts per million (ppm) or lower
- Water temperature is 140°F (60°C) or lower with pressure at 80 psig (550 kPa) or lower

This recommendation also applies to MUNICIPEX when used with ASTM F2080 fittings.

A plumbing system with water quality conditions beyond those listed above should be discussed with REHAU before installation of MUNICIPEX pipe.

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