

Aquatherm Technical Bulletin

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Disinfecting Aquatherm Piping Systems

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Chlorine Dioxide as Disinfectant

The use of chlorine dioxide as a disinfectant in the drinking water supply has been increasing in some areas over the last few years. This increase in use is because chlorine dioxide is low-priced to produce and easy to dose, compared to straight chlorine. In addition, the chemical reactivity of chlorine dioxide, and thus the disinfecting effect, is about three times higher than in the case of chlorine. However, materials in the drinking water system are affected due to the high oxidation potential of chlorine dioxide. Pipe and pipe joining materials can be damaged by the high oxidation potential. Piping components are also at risk of being damaged, regardless of whether these components are made of plastic or metal.

Therefore, Aquatherm does not recommend using chlorine dioxide with our system components without prior review and approval of the specific system design by Aquatherm.

Chemical and thermal disinfection of aquatherm drinking water systems made of Polypropylene

a) Chemical disinfection of drinking water systems

Concerning the disinfection of a potable water piping system is a temporary or “one-time” measure. A potable drinking water system comprises piping from consumer’s tap to the point of connection to the public utility. In general, drinking water system disinfection is applied at the time of system installation, whenever there is an addition or alteration made to the system or if there is a case of a proven contamination in the system. The following are procedures for disinfecting Aquatherm pipe systems for drinking water.

Clean and disinfect potable domestic water piping as follows:

- 1) Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
- 2) Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow the procedures described below:
 1. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 2. Fill and isolate system according to either of the following:
 - A. Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/l) of chlorine. Isolate with valves and allow to stand for 24 hours.
 - B. Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.

3. Flush system with clean, potable water until no chlorine is in the water coming from system after the standing time.
 - A. Repeat procedures if biological examination shows contamination.
 - B. Submit water samples in sterile bottles to authorities having jurisdiction.
4. Alternatively, 150 ppm (150 mg/l) hydrogen peroxide (H₂O₂) can be used for 24 hours. A temperature of 86°F (30 °C) must not be exceeded during the disinfection process. The use of a disinfection process, especially with chlorinated water can have a direct influence on the lifetime of the drinking water system. It is not recommended to use chlorine dioxide.

b) Chemical disinfection of drinking water

In the case of continuous disinfection of the water supply with chlorine or chloramine², as is done in many municipalities, Aquatherm pipe has been tested in accordance with ASTM F2389 “Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems” and ASTM F2023 “Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water” and has been found to meet the standards for long-term exposure to the most stringent amounts of chlorine or chloramine (4.0 ppm) allowed in drinking water by the EPA.² The use of chlorine dioxide is not recommended without prior approval.¹

c) Thermal disinfection of the system

In general, thermal disinfection is possible. In the case of thermal disinfection for the prevention of legionella bacteria, the water temperature should be adjusted to 160°F (70°C) for at least 30 minutes at all points of the drinking water system. The maximum permissible limits of temperature and pressure service for the piping should be adhered to during this type of disinfection.¹

¹ Revised 11-6-2013

² Revised 3-2-2016

³ Revised 4-18-2017