

# Aquatherm Technical Bulletin

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## Water Hammer

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Many state and local codes require the installation of water hammer arrestors at locations of quick closing valves. This is done to protect metallic pipe from the high-pressure shocks that can occur when these valves are actuated.

The pressure surge, and its effect on the pipe, is a function of the pipe material modulus and thickness. A higher modulus material, and thinner wall, will result in both a higher surge pressure and reduced capacity to absorb the energy from the pressure wave. By comparison, Aquatherm PP-R and RP (RCT) piping has a modulus of approximately 1/10 that of metal pipes so surge pressures are reduced significantly with all else being equal. The heavier wall thickness of the Aquatherm pipe also provides more material to absorb the energy from the surge pressure wave, thereby further reducing the surge and the accompanying noise.

The surge pressure created in systems operating at 8 ft/sec or lower velocity will be less than 50% of the maximum shock pressure the Aquatherm piping can withstand (725 psi).

Aquatherm does not recommend the use of water hammer arrestors in systems with flow velocity of 8 fps or less. However, they may still be required due to local codes and the local plumbing or building official should be consulted before eliminating them from a system design.

At higher flow velocity, the design engineer must still account for surge pressures and design accordingly.

### Revisions:

1. 9 Sept 2021 - Added RP (RCT)