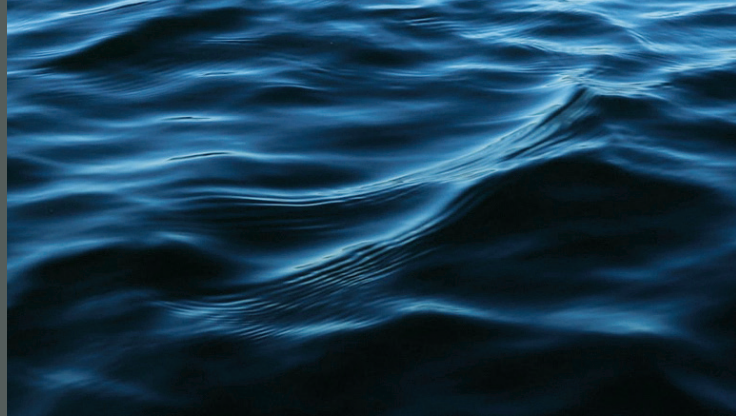
PHOENIX



Water Hammer Fact Sheet

Myth: Water hammer is caused by the mixer or tapware

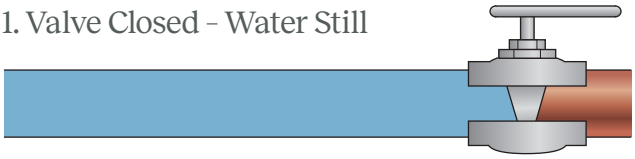
Fact: Water hammer is caused by a shock wave produced when water under pressure is turned off or shut off rapidly

This document provides the facts on water hammer and is an excerpt from The Plumbers Handbook, Ninth Edition written by the International Copper Association Australia.

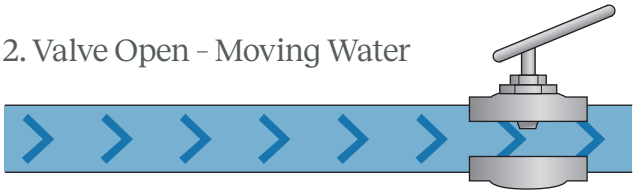
It is based on years of independent research and is published to share this knowledge with the Plumbing Industry. It has in part been altered or abbreviated for clarity.

The installation of air chambers and the reduction of water pressure below 500 kPa (as per AS/NZS 3500 requirements) was found to eliminate water hammer noise in virtually all instances.

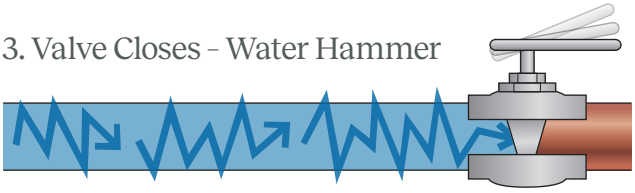
1. Valve Closed – Water Still



2. Valve Open – Moving Water



3. Valve Closes – Water Hammer



More Facts about Water Hammer

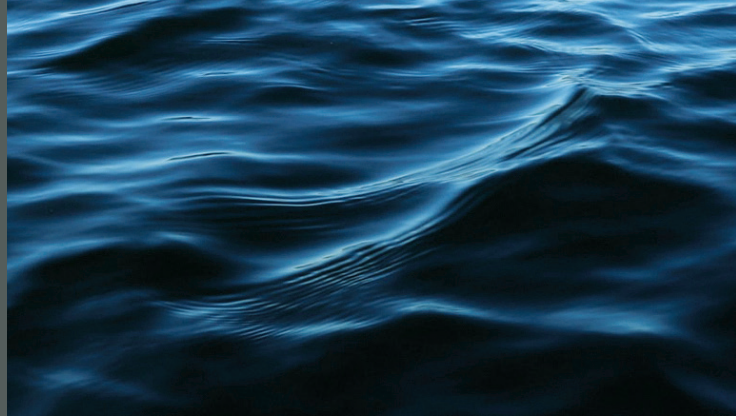
- Water hammer will occur with or without noise.
- When a quick closing lever tap or solenoid valve closes it can produce a shock wave of up to 3000 kPa and more.
- Tests show that if a quick closing valve is closed when only trickle of water is coming from it the shock wave is still around 2000 kPa.
- AS/NZS 3500 states that water meter, taps, appliances and other fixtures that may be damaged when testing the water service at 1500 kPa must be disconnected during testing. With this in mind consider the damage being caused at 3000 kPa every time a quick closing valve is closed.
- The harder the pipe material the greater the noise but it is not the noise causing damage it is the shock waves.
- Pipe work and fixtures can be damaged with or without noise if water hammer is not controlled. The noise provides a warning, therefore, any potential damage can be eliminated.
- All water services, which contain a quick closing valve, should be fitted with a hammer suppression device as recommended by AS/NZS 3500.
- To prevent damage the following recommendations should be followed for copper and plastic installations.

Note: A hammer suppression device refers to a Hammer Arrester and an Air Chamber.

Steps in Preventing Water Hammer

- If the water pressure is above 500 kPa always install a 500 kPa pressure - reducing valve at the water meter. This will eliminate the need for a pressure-limiting valve at the hot water system and this does not increase the cost.
- Clip all pipes as per AS/NZS 3500.
- Preferably use stand-off clips.
- If the pipe runs along a stud install extra clips.
- Always install at least one hammer suppression device on the cold supply and one on the hot supply side.

926 Mountain Highway, Bayswater VIC 3153 Australia | Ph: 03 9780 420 | Fax: 03 9729 3746
phoenixtapware.com.au ABN 48 007 215 876



Water Hammer Fact Sheet

- Use ball valves in place of loose jumper valves where possible. (E.g. at the meter when the meter is fitted with a non-return valve).
- When penetrating a stud, ensure the silicon is evenly distributed around the pipe.
- If a non-return valve is required prior to the dishwasher, install it as far away as possible from the dishwasher. (E.g. at the hot water system if on hot water or at the meter).'

Preferred Devices that will Help to Eliminate Water Hammer

- 500kPa pressure limiting valve
- Hammer suppression devices

Hammer suppression devices include the following;

a) Hammer arresters

Advantage: Long lasting, some have a life time guarantee if installed as per manufacturers specifications.

Disadvantage: Greater cost.

b) Air chambers

Advantage: Cheaper cost.

Disadvantage: Will progressively lose air and gradually become ineffective therefor they will need to be recharged with air at least every three years. This can be achieved when the water is turned off and the pipe drained to change a tap washer. The air chamber will not permanently eliminate all shock waves but will initially eliminate the noise and limit the impact on pipes, fittings and fixtures.

Reverse Water Hammer

This is when water hammer occurs between the tap and the outlet when there is an extended distance of pipe work.

For example, when the pipe to a shower rose is extended to install the rose on another wall to the taps.

Solutions:

- Install a hammer suppression device as close as possible to the taps on the outlet side.
- And/or reduce water pressure to 350kPa.
- And/or limit the volume of water to the rose.

The information provided is re-produced with permission and gratitude from the International Copper Association Australia.

For further information refer to the 'Practical Solutions to Water Hammer' section of The Plumbers Handbook. Click here to view the link.

926 Mountain Highway, Bayswater VIC 3153 Australia | Ph: 03 9780 420 | Fax: 03 9729 3746
phoenixtapware.com.au ABN 48 007 215 876