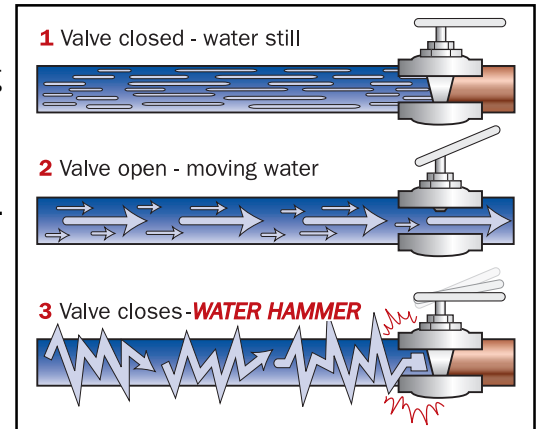


# WATER HAMMER F.A.Q.

## Frequently Asked Questions

1. **Q: What is water hammer?**

**A:** Water hammer is usually recognized by the banging or thumping noise that is heard when valves are shut off. Although this is an easy way to recognize the problem, water hammer doesn't always make these telltale noises. Water hammer occurs when the flow of moving water is suddenly stopped by a closing valve. This sudden stop causes the whole column of water behind the valve to slam into the valve, and itself, like a freight train crashing into a wall. The tremendous spike of pressure that is caused, is called water hammer, and it not only acts like a tiny explosion inside pipes, it can be just as destructive.



2. **Q: How much damage can water hammer do?**

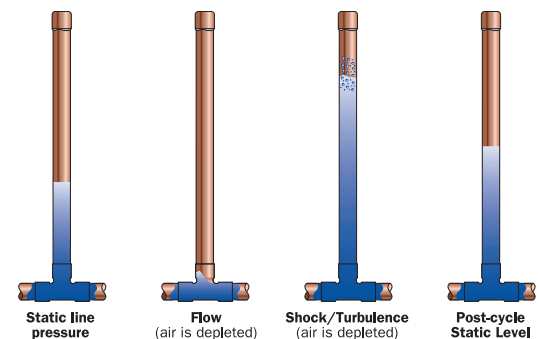
**A:** Uncontrolled water hammer on a water line of just 50 PSIG, will commonly result in pressure spikes of 250 to 400 PSIG. This pressure spike is not just at the valve, it reverberates backwards from the valve throughout the plumbing system, rattling and shaking pipes, until it is absorbed. If there are no measures taken to control it, water hammer will accelerate the failure of water heaters, valves, backflow preventers, washing machines hoses, pipe, fittings, etc.

3. **Q: What types of valves can cause water hammer?**

**A:** Any quick-closing valve can cause water hammer. In residential systems, these valves are typically found at the washing machine, dishwasher, the tub/shower, and the ice maker at the refrigerator. Kitchen or lavatory faucets, toilet ballcocks and lawn sprinklers systems can also create the problem. Water hammer can occur on both the hot and cold water supply lines.

4. **Q: Will air chambers control water hammer?**

**A:** A capped stand pipe or air chamber is not an effective solution to controlling water hammer. Since nothing separates the air from the water within an air chamber, it only takes a few short weeks before the air is absorbed into the water, leaving the air chamber waterlogged and completely ineffective. Laboratory tests confirm that the air is depleted by simple air permeation and by interaction between static pressure and flow pressure.



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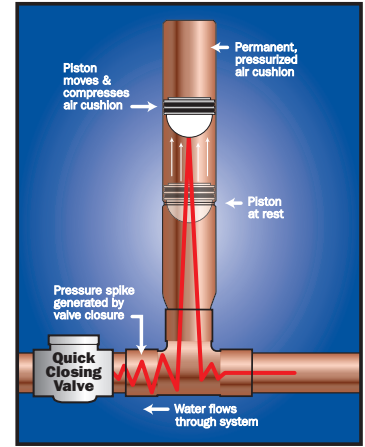


**Sioux Chief**

## WATER HAMMER F.A.Q.

### 5. Q: How can water hammer be controlled?

**A:** The most effective means of controlling water hammer is a measured, compressible cushion of air that is permanently separated from the water system, that is, an *engineered water hammer arrester*. Sioux Chief arresters employ a pressurized cushion of air and a dual o-ring piston, in a sealed seamless chamber, which permanently separates this air cushion from the water in the system. When a valve closes the water column is diverted into the arrester thus pushing the piston up the arrester chamber against the pressurized cushion of air. The air cushion in the arrester reacts instantly, preventing the pressure spike that causes water hammer. The piston then returns to its original position after the shock is absorbed, ready for the next occurrence.



### 6. Q: Will a centrally located expansion tank or large arrester control water hammer?

**A:** A common myth is that one large arrester centrally located will control hammer throughout the piping system. In reality, this does little or nothing to control hammer. The pressure spike of water hammer starts right at the valve or faucet immediately upon closure, and works its way back upstream, damaging everything in its wake. By the time the pressure spike reached the expansion tank or arrester; it would already have done its damage. Further, thermal expansion tanks are not the type of products that are defined by the ASSE 1010 Standard for continuous, maintenance free protection from water hammer. Of all the expansion tank manufacturers in the country, none of them claim that their products control water hammer.

### 7. Q: Where should the arresters be placed in the plumbing system?

**A:** Arresters should be installed as close to the culprit valve as possible. Sioux Chief recommends that arresters be installed within six feet of the valve, on both the hot line and the cold line (when applicable). The arrester loses its effectiveness the farther away from the valve it is installed. Arresters work for the plumbing system just like shock absorbers do for a car. Your car has four wheels; therefore it needs a shock absorber at each wheel (at each point of use).

### 8. Q: How long will the Sioux Chief engineered water hammer arresters last?

**A:** Although arresters are typically tested to 10,000 cycles, Sioux Chief arresters have been independently lab tested to withstand 500,000 cycles without failure. All Sioux Chief arresters are guaranteed to control water hammer for the lifetime of the plumbing system.

### 9. Q: What does the letter designation mean?

**A:** The letter designates the arrester's "size" or its capacity to control water hammer. Common arresters range from AA, the smallest, then A, B, C, D, E, and F. Sioux Chief offers the Mini-Rester line, size AA, for point-of-use applications, the Hydra-Rester line, sizes A–F, for commercial applications, and the Mega-Rester line for industrial or custom applications.

### 10. Q: Is the Mini-Rester ASSE 1010 Certified?

**A:** Yes. As a matter of fact, Sioux Chief was the first manufacturer to have a AA arrester certified by ASSE. In 1996, it was Sioux Chief who originally prompted ASSE to add the AA size to their 1010 Standard (to go along with the original A–F sizes).



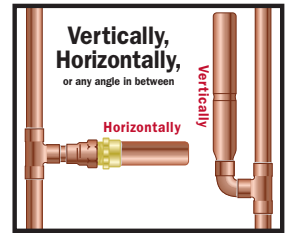
### 11. Q: Will water systems with high concentrations of Chlorine damage the arrester?

**A:** Higher concentrations of chlorine won't produce any additional wear on the o-rings, or the piston material in Sioux Chief arresters. However, whatever effect the chlorine has on the copper plumbing system, it will have the same effect on the copper body of the arrester. For some special commercial or industrial applications where the system contains water that is chemically, or otherwise specially treated, Sioux Chief offers the Mega-Rester in stainless steel for an added level of corrosion protection.



**12. Q: If the arrester is installed horizontally, is there more wear on the o-rings?**

**A:** No. Sioux Chief arresters can be installed vertically, horizontally, or any angle in between. There have been millions of Sioux Chief arresters installed worldwide over the past 15 years, and we have never had a problem due to worn-out o-rings regardless of their position of installation.



**13. Q: Are Sioux Chief water hammer arresters safe for potable water systems?**

**A:** All Sioux Chief water hammer arresters are safe for potable water systems. The dual o-ring piston is lubricated with FDA approved Dow Corning 111 silicone compound and all solder joints use lead-free solder. (see following note)

*Safe Drinking Water Act/NSF Standard 61*

*According to the Safe Drinking Water Act (SDWA), it is unlawful to sell any plumbing fixture or fitting that is not "lead-free" after August 6, 1998. In addition, "endpoint" devices only (faucets, etc., defined by NSF 61, Section 9) are required to be certified to the NSF 61 Standard.*



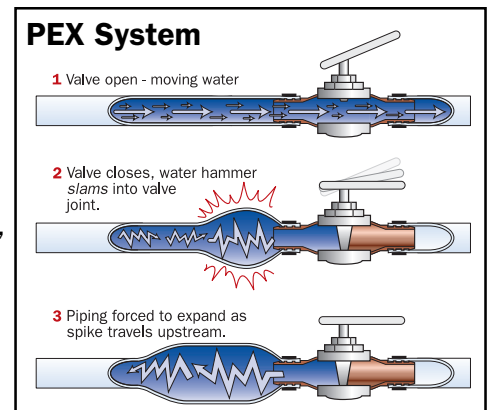
*All Sioux Chief products are considered "in-line" devices (pipe, fittings, etc., defined by NSF 61, Sections 8 and 4) and meet the lead-free requirements for NSF 61 as defined by the SDWA and are not required to be certified to the NSF 61 Standard. Thus, all Sioux Chief products are acceptable to sell now and after August 6, 1998 since they meet the requirements of the Safe Drinking Water Act and NSF 61.*

**14. Q: Is it necessary to have an access panel installed to service or change the arresters?**

**A:** Sioux Chief arresters are certified by ASSE, which requires certified arresters to be "... designed to provide continuous protection, without maintenance ...". Therefore, no access panels are required. However, it is always a good idea to check with your local plumbing code authority or the specifying engineer for any project to make sure you are in compliance with the local code requirements and/or project specifications.

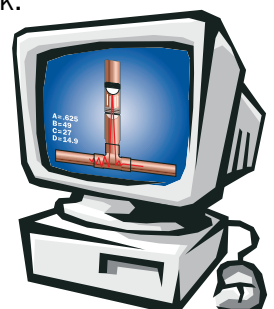
**15. Q: Do you need water hammer arresters on plastic pipe?**

**A:** When water hammer is present, it must be controlled, regardless of the piping material. It may be true that plastic tube does not seem to transmit as much noise as copper, but the energy from the flowing water is still there. It has to go somewhere. So where does all that momentum energy go when you shut off a valve or faucet? It goes right into the plastic pipe and connections; they take the *full brunt* of the pressure spike. Every time a valve closes, the plastic pipe system itself is forced to absorb the energy by expanding and contracting over and over again—which is not good. In high flow-rate situations, like lawn sprinkler systems, pipe failures have been seen within a few days of installation due to stress fractures caused by water hammer. In lower flow situations, the same thing is happening, it just takes longer to develop.



**16. Q: What if I have a special application or an uncommon system that requires an arrester?**

**A:** Choosing the correct size arrester can be a complicated and sometimes difficult task. Many water hammer applications employ complex or uncommon types of fixtures, and some involve flow pressures or pipe sizes that are outside the typical range. In these situations, custom sizing is recommended for each specific application. If you have such an application, Sioux Chief can assist you in choosing the correct arrester. Simply fill out our Arrester Sizing Form from our current catalog or on our web site. Your specific job will be analyzed by our computerized sizing model and the results will be sent to you, including the required arrester size and information on how to order.





The Sioux Chief complete line of water hammer arresters is one of the most well-designed and trusted arrester lines in the world. Sioux Chief has been a pioneer in the field of water hammer control for nearly twenty years, and has experts on staff to assist engineers and contractors with questions or problems regarding arrester sizing and placement.

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