The More You Know

August 28, 2024

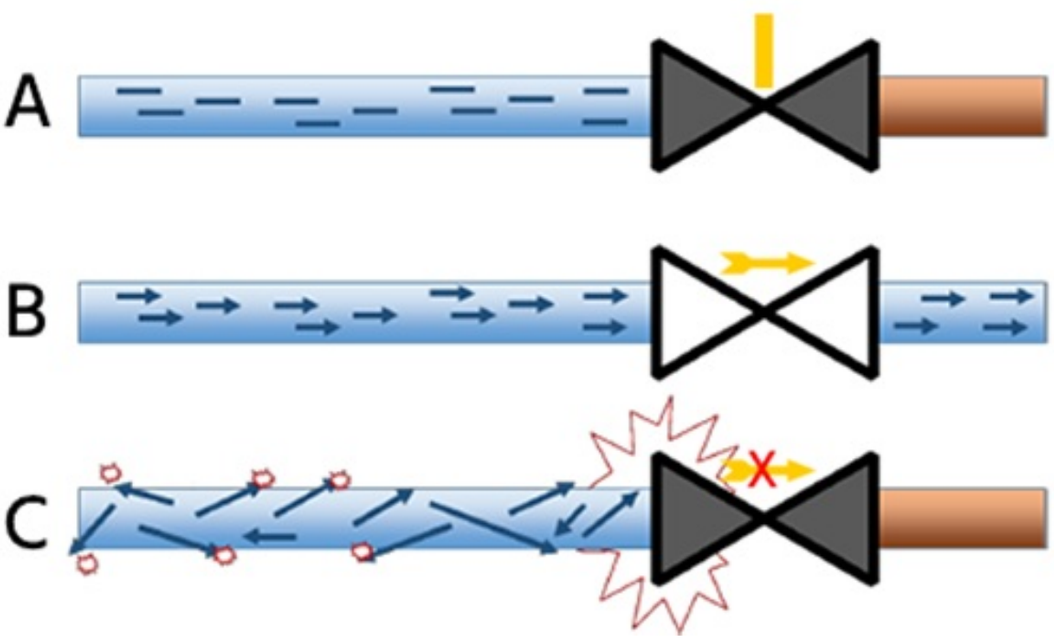
Handling Water Hammer

Milwaukee Valve offers a wide variety of products, from gates and globes to ball and butterfly valves. The quarter-turn products (ball & butterfly) operate faster than the gates or globes, consume less space, and weigh significantly less than their multi-turn counterparts. So why aren't quarter-turn valves used in every application?

For many commercial jobs, the answer can be summed up in two words… Water Hammer.

Water hammer occurs when the flow of an incompressible media (water) is suddenly stopped. The energy contained in the velocity of the flowing water quickly converts into pressure energy. As a rough example, let's consider a simple scenario. Let's agree to the following conditions:

- Typical municipal water pressure of 60 psig,
- ½" copper tube,
- And a flow velocity of 5 ft/sec (maximum recommendation for hot water systems).



For the sake of this example, also consider the time required to close each of these valves. The ball valve can be closed in a second, while the gate valve takes about 8 seconds. Upstream pipe length is also a consideration, so let's use about 100 ft.

Given these parameters, the ball valve would produce a total developed pressure of somewhere around 100 psi, which is a 66.7% increase over the normal operating pressure. The gate valve, on the other hand, would produce a pressure of only 64 psi, which is significantly less. Also of the utmost importance, the ball valve's abrupt closure produces a pressure wave that travels close to the speed of sound back and forth in the piping until the energy is dissipated by friction in the pipe. That wave is what creates all the banging and noise in the pipes.

This is a very simple example, but the results are real and can be damaging. Any increase in pressure, or upstream pipe length, or flow velocity will dramatically increase the pressure spike; often times by a factor of 5-6x. There are folks that make a comfortable living selling water hammer arrestors, but they are generally unnecessary in a well-designed and thought-out system.

And these increased pressures and constantly changing conditions are among the important factors that Milwaukee Valve considers when making the decisions to maintain heavier patterns for our multi-turn products.

For more information on gate, globe, ball or butterfly valves, visit **www.MilwaukeeValve.com** or contact your Milwaukee Valve customer service rep today. A complete listing, by territory, can be searched at our website, at **www.MilwaukeeValve.com/Find-Sales-Rep/**.

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