

WATER HAMMER RISKS IN DAIRY SHEDS

WHAT IS WATER HAMMER?

Water hammer is a destructive force related to the incompressibility of water combined with a sudden change in velocity and can lead to the destruction of pipes and fittings. It is a phenomenon that often occurs when filling an empty pipe or quickly closing a valve. These actions can make the flowrate of fluid in the pipe change rapidly which sends a shock wave through the closed system, stressing the pipes, creating a hammering noise and destroying pipes.

Water hammer can cause very high pressures in pipes and very high forces on pipe supports and can lead to burst pipes and leakages.

WATER HAMMER IN DAIRY SHEDS

A dairy shed using PVC fittings needs to have its water system designed by a hydraulic engineer to ensure the water hammer risk is eliminated. Sudden pressure changes in water, however brief, can lead to water hammer.

Dairy sheds in particular use high pressure systems to provide a lot of water for the wash down process. The volume of water coupled with the high-pressure systems are a risk of water hammer if they are not designed properly.

The greatest stress is on the section of pipework closest to the cause of the water hammer and is often accentuated on fittings with a change in direction, e.g. elbows and tee's.

CAUSES OF WATER HAMMER

- The valves before a washdown hose are typically quarter turn shut off valves or other quick acting valves. The sudden or fast closing of washdown nozzles can cause water hammer even if an arrestor is used.
- Closing a valve too quickly
- Pumps tripping or starting up suddenly
- The pump is started up with air in the line and no outlet open
- Closure of a non-return valve / solenoid valve

WAYS TO REDUCE WATER HAMMER

- Use soft start pump motors
- Open and close valves slowly
- Ensure outlet is open and fill empty lines slowly
- Use water hammer arrestors or pressure vessels / accumulators