Tech Sheet #PS701

How to Crash Your System with a Blocked Strainer!

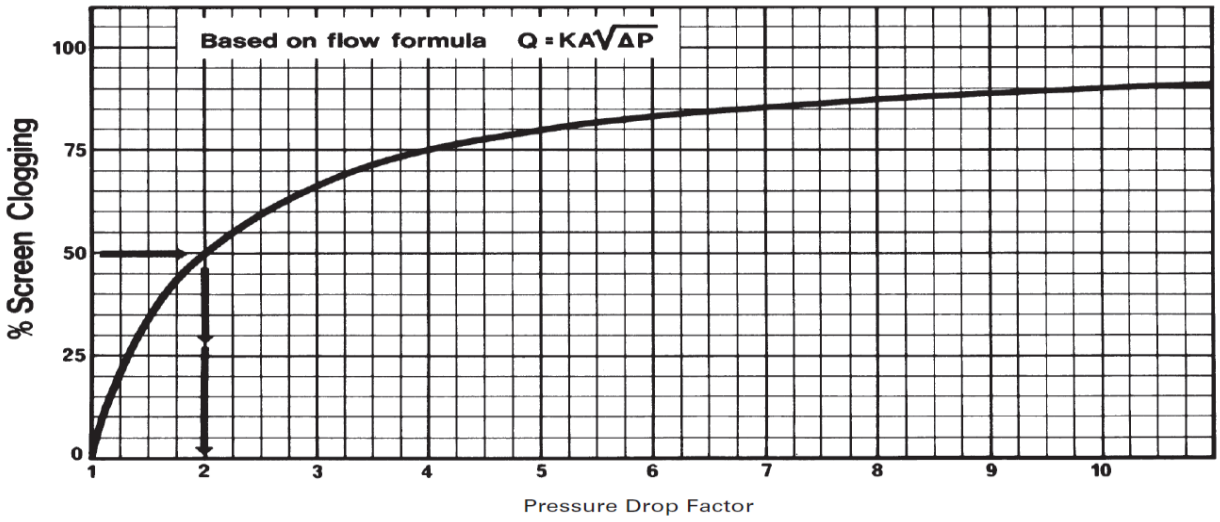


Every designer knows that periodic cleaning of a strainer is necessary. There is an interior screen, through which all media must pass. The "trick" is to make sure the system operator knows there is a strainer in the system, and **it is essential** to clean it regularly.

The worst-case scenario of a completely blocked strainer is a screen that ruptures due to differential pressures far beyond its design parameters. Big chunks of compacted sediment will travel downstream contaminating the process media, clog the pump, valves, or damage the very instrumentation that the strainer is supposed to protect.

However, and perhaps even more insidious, is the costs associated with slow and preventable restriction of flow, caused by neglected and slowly filling strainer screens.

The graph below shows the exponential pressure loss as the strainer screen becomes increasingly clogged. Each strainer manufacturer should have similar tables specific to their products. Many strainer manufacturers also have energy calculators that show the additional dollar costs of operating a strainer with various levels of restricted flow**.** These calculations are based on the Darcy Weisbach flow formula shown on the graph below.



Q=flow, KA= C_v the flow coefficient DeltaP = pressure differential

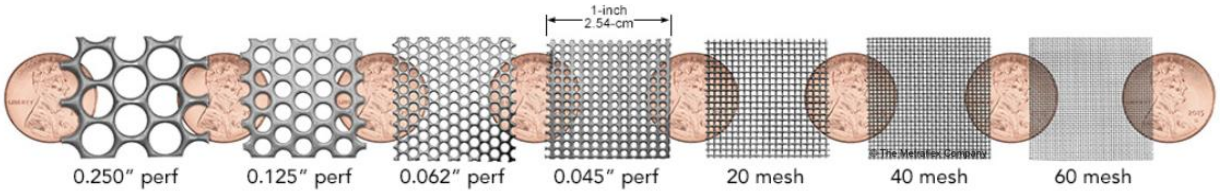
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Net Positive Suction Head (NPSH) is a value describing the pressure entering a pump. It is extremely important to have a positive suction pressure for the proper functioning of your pump. It is common practice to locate a strainer just upstream of a pump. However, a slowly clogging strainer will slowly degrade the pumps performance, ultimately leading to cavitation. This slow decline too often is attributed to **an aging** pump. **However,** the real culprit is a clogged strainer. As many pumps can pass surprisingly large solids, installing the strainer downstream of the pump should **also be considered**. Refer to "Best Practices for Strainer Location" by Jim Elsey, Pumps and Systems magazine www.pumpsandsystems.com/best-practices-strainer-location, for a full discussion of where to locate a strainer, relative to the pump.

Choosing the Right Strainer Design. Basket or Y-type, as well as the right screen opening, is also crucial for proper performance. Refer to FCI "Engineering Specification for the Selection, Installation and Maintenance of Pipeline Strainers" accessible on www.fluidcontrolsinstitute.org.

The most significant difference between the **basket and Y-type strainer** is the need to **isolate the basket strainer** from the flow to access and clean the screen. Whereas the Y-type strainer has a blow down valve that allows cleaning while the strainer is operational.

Strainers are incredibly simple and effective. Strainers do their job with no additional energy input and if sized properly, can function without any attention for months. This may be the very reason they are so often forgotten or neglected. When your system starts to show a decline in performance, look at the simple equipment first!



Relative Perforation and Mesh Size Comparison

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