



<b>Application Note to the Field</b>	<b>Using Strainers with Gear Pumps</b>
<b>Application Note Number:</b> 1601-1	<b>Date:</b> Jan. 21, 2016; Revised Sept. 2022

### **Suction Side Strainers: Yes or No?**

Placing a strainer, screen or filter on the suction side of a pump is not a simple yes or no question; there are a few thoughts to consider before making the choice.

Gear pumps are designed with very close internal clearances. The entrance of foreign material could cause damage or rapid wear to the pump components. For this reason, a strainer is particularly important at start-up to help clean the system of any objects or debris that may be present.

A strainer or screen with large openings will prevent an egregious error, such as weld slag, nuts or bolts, or large clumps of material from entering the pump and causing damage or malfunction. However, a large mesh strainer will not prevent wear that could be caused by excessive concentration of small particles.

If the strainer has holes that are too small, or clogs with material and is not properly maintained, the pressure drop across the filter element can increase to the point where the pump is starved of suction pressure, preventing flow and potentially damaging the pump via dry-running or cavitation.

Therefore, selection of the proper strainer is best left to the system designer to determine whether protection from only large elements is adequate knowing that the filter may not be frequently checked for clogs or that the fluid will be inherently clean; or wanting to protect the pump with a screen mesh that closely matches the minimum particle size, with the understanding that suction issues can occur from lack of maintenance.

### **What if solids are present in the fluid?**

Gear pumps are designed to handle clean fluids. For gear pump models H1F-H9F, 31F-39F, M0-M8, 41-45 or 2R/2F, the maximum solids concentration should be limited to 1% by volume and the maximum particle size that can be passed through the pump is 37 microns. A filter size of 400 US Mesh can be used to effectively filter out all particles greater than 37 microns in size. Models H12R-H14F and 312R-314F can handle particles up to 60 microns in size at 1% concentration by volume. A filter size of 230 US Mesh can be used for these models to filter out all particles greater than 60 microns in size.

Even though an allowable amount of solids is present in the fluid, wear can occur under the right conditions. Abrasive particles and a high RPM will contribute to excessive wear; while soft particles, a slow speed and wear resistant materials (such as Silicon Carbide) will help to significantly reduce, but not eliminate, wear.