

ZGF Tech Brief

Pump Seal Protection

The Most Advanced, Automatic,
Non-Disposable Liquid Filtration System



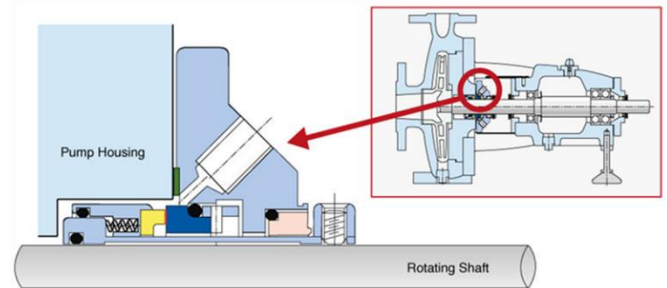
Maximize Pump Seal Life and Minimize Total Operating Costs by Implementing Consistent and Reliable Filtration that Provides Uninterrupted Flow & Effective Capture of Particles 50µ and Larger

Many industrial operations use pumps fitted with mechanical seals. The mechanical seal is engineered to operate with a thin fluid film separating the rotating and stationary seal faces and rely on seal water for effective operation.

These pumps require “seal water” to:

- Cool and seal the shaft,
- Lubricate the seal, and
- Flush away debris/contaminants from the seal.

If this fluid film (i.e., seal water) is not stable or not present, the two faces will contact, overheat, and damage each other and the mechanical seal will fail, causing the pump to fail.



The pump seal water can commingle with process fluids and could be directed back into the process. Therefore, the seal water must be compatible with the process fluid. Quite often, the process fluid is utilized for pump seal water. However, it is critical that the fluid is properly filtered to remove any contaminants that could damage the seal.

Filtration is essential. Poor quality seal water can cause premature wear and tear on the pump and other components. Each seal manufacturer and / or type has specific seal water flow and pressure requirements, as well as particle size limitations. **However, it is good practice to implement filtration designed to capture particles 50 micron and larger.**

Seal water quality issues due to poor filtration cause the majority of seal failures. The issues include:

- a build-up of solids that restrict the flow of seal water
- wear and tear due to the abrasive and / or erosive nature of the suspended solids

When the seal fails, the pump must be removed and repaired. The maintenance cost (components and labor) is typically several thousands of dollars. But the lost production costs could be several thousands of dollars per hour.

Increasing the mean time between repair (MTBR) means:

- lower maintenance costs
- improved equipment uptime (i.e., higher productivity)
- better system performance

Pump seal water can be a variety of fluids including:

- city water
- mill water
- process fluid
- recycled water

A large plant / mill can spend hundreds of thousands of dollars to use and then treat seal water!

City water is the most expensive. You pay to use the water and then pay again to treat / dispose of it. In some colder climates, the city water is significantly colder than process fluid which is not ideal either.

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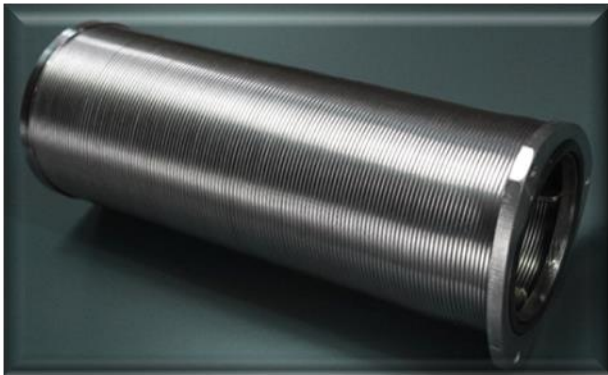
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Ideally, you want to use process fluid or recycled water. This fluid is free and typically temperate (i.e., not too warm and not too cold).

Both city water and process fluid / recycled water should be filtered!

Examples of process fluids used for seal water included filtered white water in a paper mill and filtered wastewater effluent. **To ensure maximum seal life, the flow of seal water must be uninterrupted and free of debris / particles larger than 50 micron.**

The ZGF EZ Clean filtration systems (Phoenix and EC Series) are the most advanced, best in class, automatic, non-disposable liquid filtration systems in existence. All EZ Clean filtration systems provide uninterrupted flow and utilize the ZGF Spring Filter element. The ZGF Spring Filter element sets the standard for permanent media, fully automatic, self-cleaning filters. The absolute gap allows ZGF filter systems to capture contaminants efficiently and effectively from liquids; and the unique continuous coil design allows for complete cleaning of the filter element with each backwash. The proprietary, non-disposable, absolute gap filter elements are available in micron ratings ranging from 20 – 400 micron and are guaranteed for 5-years!



The ZGF Spring Filter element opens uniformly along its entire length during backwash. The benefits are as follows:

1. Particles wedged or lodged are quickly released and washed away as the gap is increased.
2. The Spring filter element “shimmers” which further enhances the cleaning process.
3. The moment the filter element begins to open during backwash, the fluid velocity is instantaneously increased and subsequently followed by a surge in flow that scours the coil effectively and efficiently removing the contaminants.

ZGF EZ Clean Filtration: Absolute Gap, Permanent Media, Uninterrupted Flow

Filter	20 µ	35 µ	50 µ	75 µ	100 µ	150 µ	200 µ	400 µ
EC100 (per pod)	10 gpm	15 gpm	20 gpm	22 gpm	28 gpm	28 gpm	28 gpm	28 gpm
Phoenix	60 gpm	110 gpm	150 gpm	180 gpm	250 gpm	250 gpm	250 gpm	250 gpm