

Automatic backwash systems for fine filtration

Lenzing OptiFil® Filter

The OptiFil® Filter is a fully automatic, continuous backwash filtration system capable of capturing solids as fine as 1 micron. It can achieve this fine filtration level as a result of a patented backwash mechanism design that prevents solids bypass. In the center of the OptiFil® multi-layer cylindrical screen lies one single filter media layer. That layer is available in metal fiber fabric, sintered stainless steel fleece or woven synthetic media, all in a multitude of micron ratings. Solid contaminants are either retained inside depth media or on top of surface media. After the preset pressure drop across the OptiFil® has been reached, the backwash mechanism is triggered and the screen is cleaned methodically in a matter of seconds via backwash. An extremely small percentage of the process flow is used at any given moment for backwashing purposes, therefore the reject volume is extremely low. The filtration process continues throughout the backwash sequence.



Advantages

- High backwash efficiency
- Filter fineness down to 1 µm
- Patented backwash mechanism

Fluids Filtered

- Acids, lye, solvents, resins, paint
- Process water, river water, sea water, potable water, well water, cooling water, waste water, formation water
- Sugar solutions, molasses, starch
- Oil, oil additives, cooling lubricants, cleaning bath solutions, surfactants



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Filtration

Unfiltered fluid is fed to the P1 chamber through the inlet by means of the feed pump. Separation of particles from the liquid occurs when the unfiltered fluid flows from the P1 (unfiltered fluid) chamber into the P2 (filtrate) chamber. Solid contaminants are captured by a perforated screen positioned between these chambers. Blockage of the filter media by captured solids causes the differential pressure (P) between chambers P1 and P2 to increase continually. The increase in differential pressure is managed by a control system. After reaching a preset differential pressure level, the backwash step is triggered.

Backwashing

After the maximum volume of solid contaminants has been captured, the entire surface of the filter media is cleaned via a backwash process. Only one single full rotation of the mechanical backwash mechanism around the inside wall of the cylindrical screen is required. That full rotation is performed in just seconds. The channel shaped opening in the special plastic compound backwash strip completely seals the inside surface of the perforated cylindrical screen that supports the filter media layer. The screen is backwashed, that is to say, embedded solid contaminants are completely removed, using just a very small volume of process fluid (filtrate). After having cleaned the entire screen, the backwash mechanism returns to a waiting position until such time as the differential pressure reaches the preset level once again.

Operating principle

