

Automatic backwash filter for fine filtration and gel particle separation.

The LENZING ViscoFil system has been developed for the separation of fine particles and soft gel particles out of high viscous fluids.

The unique backwash mechanism enables the usage of depth filter material at lowest backwash quantities and with continuous filtration.

With over 1,000 installations worldwide this system has reached market leadership in specific processes for decades. Its technology is considered state-of-theart for the filtration of high viscous fluids.

The unique combination of backwash mechanism and manufacturing quality enables the use of depth filter materials for an efficient separation of gel particles.

Advantages

- > Suitable for very high viscous fluids
- > Filter fineness down to 3 µm
- > Filtration of gel particles
- > Completely closed system

Application samples

- > Spinning and casting solutions: viscose, polyacrylics, polyimides, cellulose acetate, spandex, aramid
- > Resins, varnishes, petrochemical products, hot-melt adhesives, gelatin, honey





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15 000 kg

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FUNCTIONAL PRINCIPLE

During the filtration the backwash mechanism remains in waiting position [1] (= end position). The filtration works from the inside to the outside.

An automatic backwash is triggered by a preset differential pressure level (or by timer).

The backwash mechanism [2] moves from one end position to the other.

Thereby, the flow direction is reversed at a very small part of the filter surface. The higher the flow rate, the more efficient are the particles flushed [3] out of the filter material.

The sealing [4] between the unfiltrate and the reject chamber enables lowest reject quantities.

Different materials (e.g. standard steel up to 316Ti stainless steel) are available on request(

Operating temperatures and pressures are adjusted to each individual application.

Different filter materials [5] enable individual applications.







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GEL FILTRATION

Gel particles can basically be formed in any process in which solids are dissolved in a solvent.

Depending on the production process, these can then cause quality problems in the end product or failures in the plant technology. Therefore, gel particles set special requirements on filter systems, whereby in particular four decisive factors influence the separation of gel particles:

- > Depth effect of the filter material
- > Texture of the filter material
- > Differential pressure
- > Residence time of the gel particle in the filter material

The LENZING ViscoFil system offers highest efficiency for the separation of soft gel particles by:

- > **Depth filtration** using multi-layer sintered stainless steel fiber fleece with a filter fineness down to 3 μ m.
- > A unique installation method of the stainless steel fiber fleece that ensures an extremely rigid structure. This prevents a change of pore size at changing pressure conditions.
- > Filtration at **low differential pressure.** This prevents the gel particles from being pressed through the filter material.
- > Periodic backwashing. This also prevents gel particles from passing through the pores of the filter material.

This unique filtration technology minimizes the migration of gel particles into the product!

Depth filtration by means of multi-layer sintered stainless steel fiber fleece (down to $3 \,\mu$ m)



Installation detail stainless steel fiber fleece



DIFFERENTIAL PRESSURE CURVE



 ΔP -Recording of differential pressure curve

THE VISCOFIL-EFFECT for gel particles

Periodic backwashing prevents a gel particle from having enough time to penetrate a pore.

The simulation below shows the effect of dwell time on the penetration of a pore by a gel particle.

simulated gel particle

constant AP





The gel particle (simulated as a blue egg) penetrates into the pore (bottleneck) even at low differential pressure.

As time progresses, the gel particle deforms and penetrates deeper into the pore at the same differential pressure.



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Recording of the differential pressure curve on the HMI of the control unit. By fully automatic backwashing the initial differential pressure is always reached again and again.

Given enough time and differential pressure any gel particle would thus penetrate any type of filter material.



INSTALLATION SIZES



ViscoFil-5

For the filtration of smaller process streams with minimum residence time and low dead space design for the production of resins, adhesives and other viscous media



ViscoFil-KKF-18/20 For the filtration of large process streams in the viscose fiber industry



ViscoFil-20 For the filtration of high viscous media that require high resistance against corrosion

MATERIALS

- > Carbon steel
- > Stainless steel 316 Ti/L (1.4404, 1.4571)
- > Special alloys on request

TECHNICAL DATA

| Filter fineness | betw |
|---|---------------|
| Temperature | 0 - 120° |
| Throughput per filter | (depending or |
| Viscosity | |
| Operating pressures: ViscoFil-5 ViscoFil-KKF-18/20 ViscoFil-20 | |

FILTER MATERIAL



Metal fiber fleece made of stainless steel for depth filtration and for the separation of gel particles (3 μ m) enables:



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SEALINGS

- > EPDM
- > Silicone
- > Buna
- > FKM (flouro-rubber)
- > PTFE

veen 3 µm and 100 µm

C (up to 200°C on demand)

0.1 – 20 m³/h n the individual application)

up to 200,000 cP

25 bar 16 bar 20 bar

- > High dirt holding capacity
- > Depth filtration for gel particles
- > Lowest initial differential pressure

Our unique manufacturing process ensures the best quality of the filter material thanks to highest porosity and narrowest pore size distribution.



LABORATORY AND TECHNICAL CENTER

State-of-the-art laboratory equipment for different methods of analysis and in-house technical center for pilot installations for individual filtration solutions.









Filling of laboratory pressure filter

assures satisfied customers, worldwide.

INSTALLATION EXAMPLES





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Reliable continuous filtration coupled with highest backwash efficiency