Welcome

to Lenzing Technik

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Innovative by nature

LenzingTechnik

Product Presentation
Lenzing OptiFil®

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Lenzing OptiFil ®

1. **Working Area**
2. **Working Principle**
3. **Construction Details**
4. **Product Features**
5. **Dimensions / Technical Data**
6. **Operation Modes:**
   - Backwash Filter
   - Depth Filter
   - Cake Filter
   - Precoat Filter
7. **Selected Applications / References**

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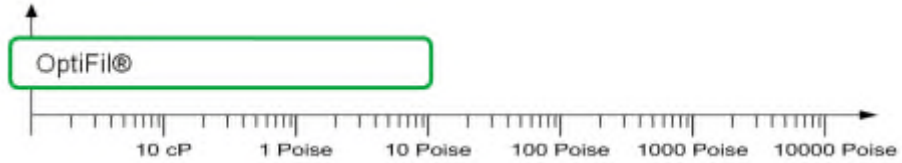
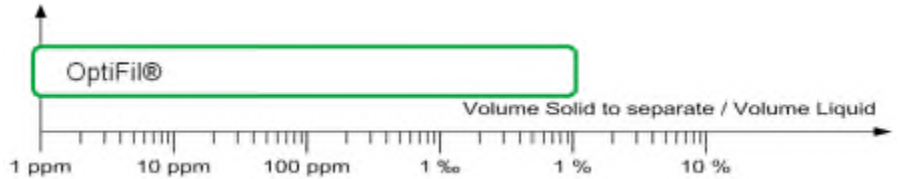
Working Area

- Viscosity: 0 – 10.000 cP



- Solid content: 1 – 10 000 ppm (depending on operation mode)



- Temperature: 0 – 120°C (up to 200°C on request)
- Flow rate per filter: 0.1 – 1 500 m³/h (depending on operation mode)
- Design pressure: 10 bar (on request higher)
- Filter fineness: 1 – 2 000 µm (depending on filter material)

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Working Principle

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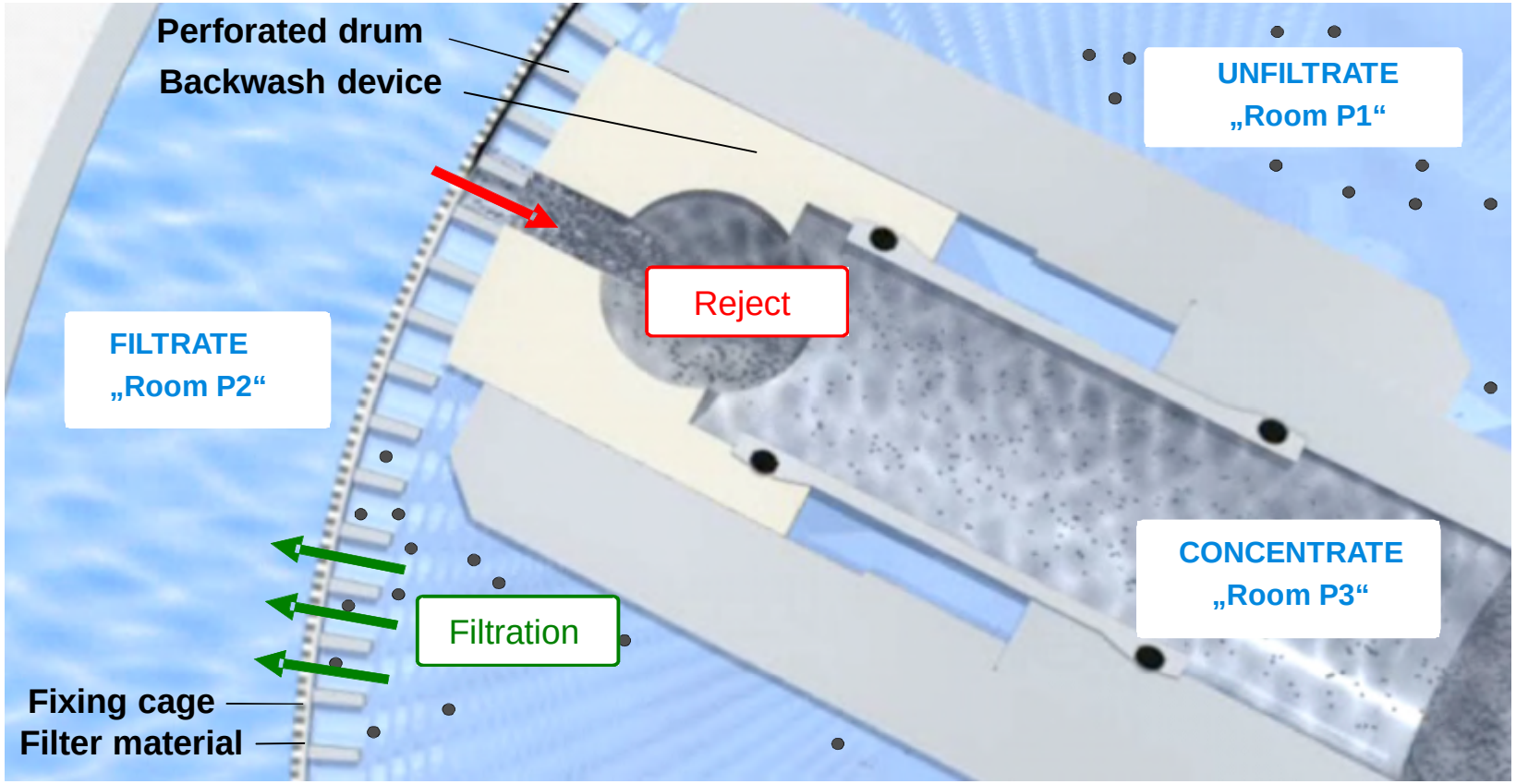
Working Principle



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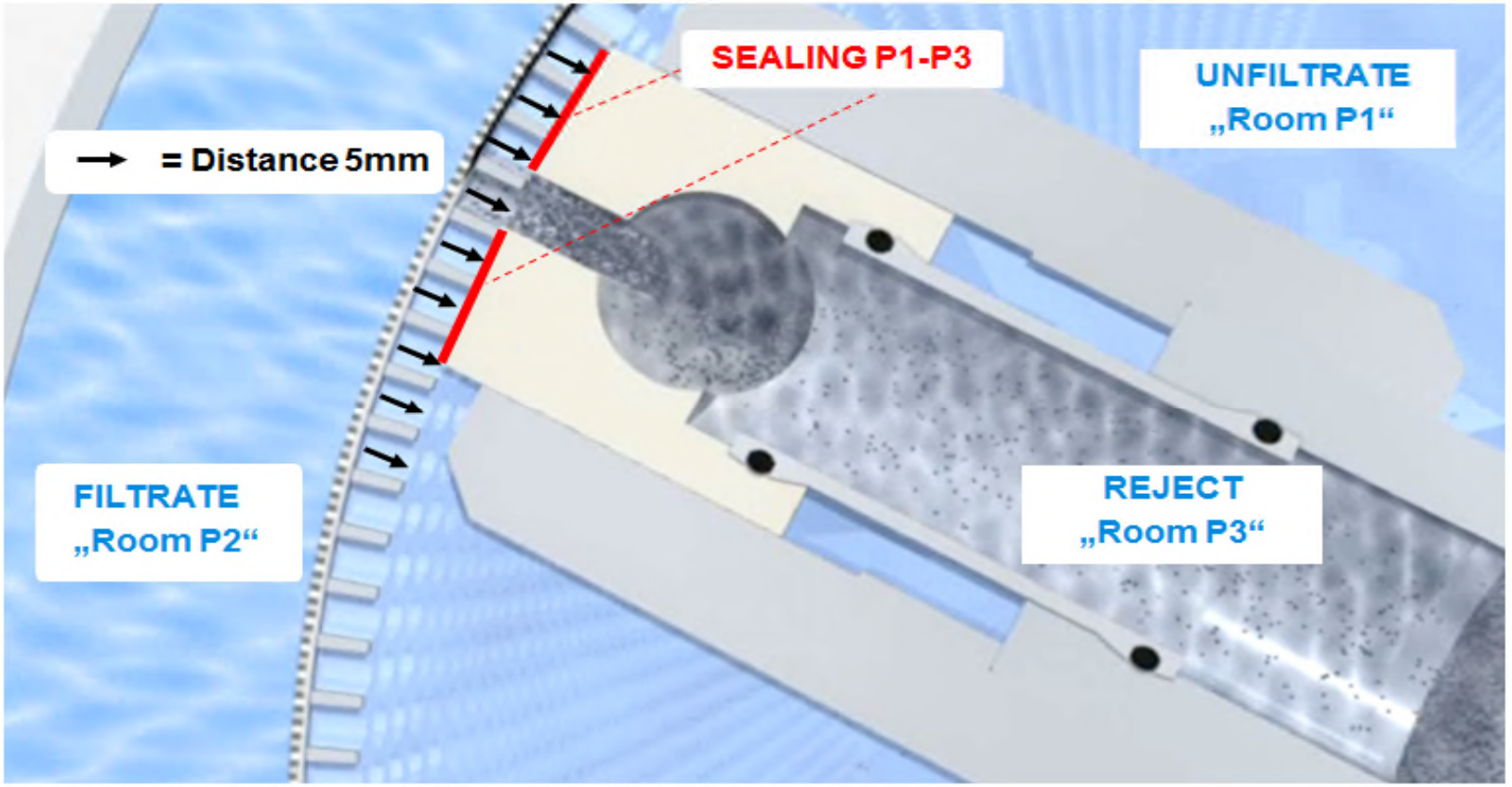
Key Features



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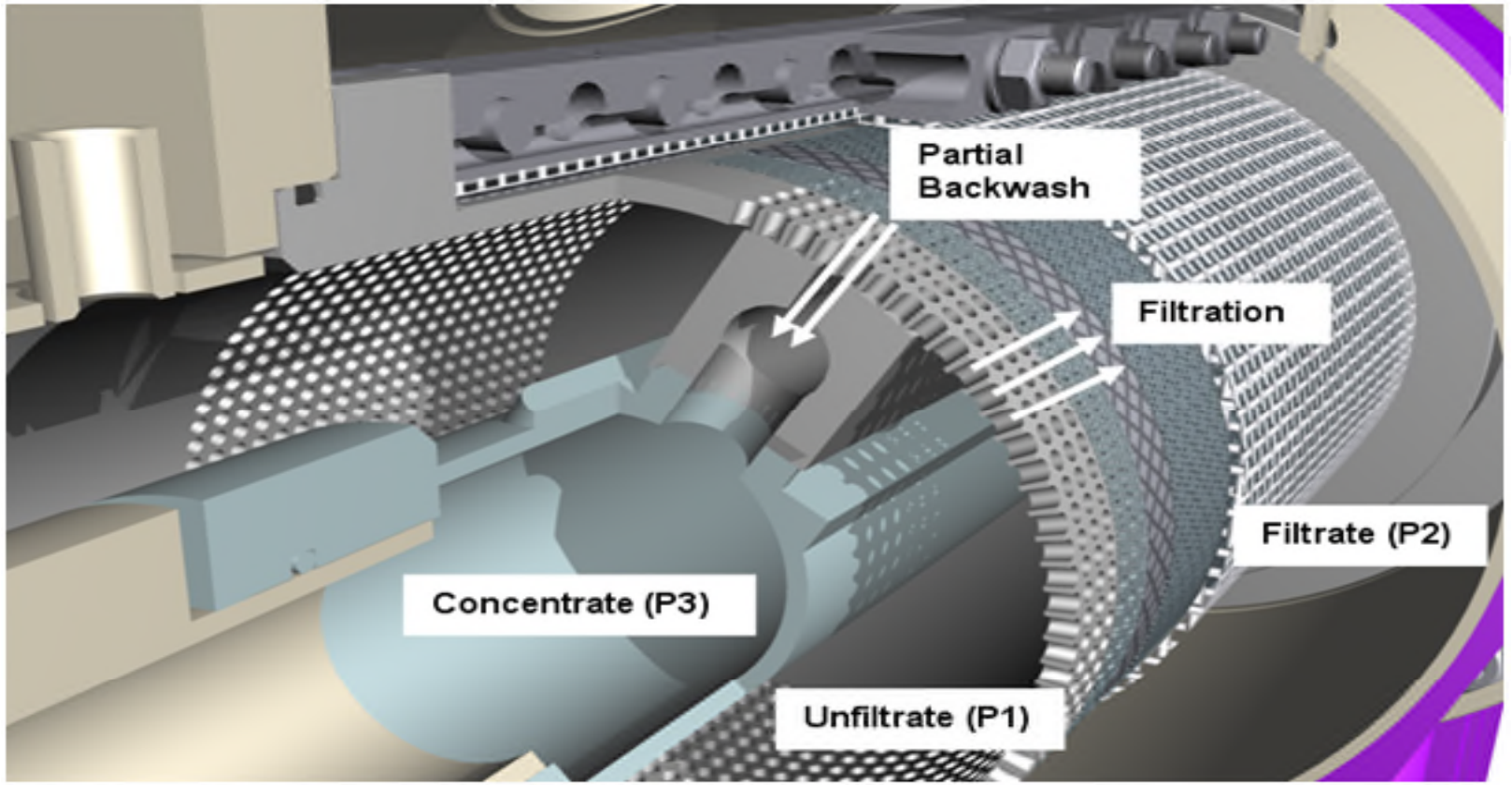
Construction Details



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Product Features (1)

- Fully automatic system
- Any type of filter material applicable
  (Woven fabric or nonwoven fleece, stainless steel or plastic)
- Surface (fabric), depth (fleece), cake or precoat filtration
- Minimum losses (patented regeneration system)
- Space-saving plant setup
- Simple and easy to install (one automatic valve per filter)
- Completely closed system (no vapor release, anaerobic)

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Product Features (2)

- Filter fineness down to 3µm (fleece), 5µm (woven fabric), 1 µm (with filter cake)
- High solid content possible (patented regeneration system)
- Partial backwash during filtration (continuous system)
- High Temperatures (standard filters up to 120°C, on request up to 200°C possible)
- Chemical compatibility (Filters available in Super Duplex, on request in nickel based alloys)

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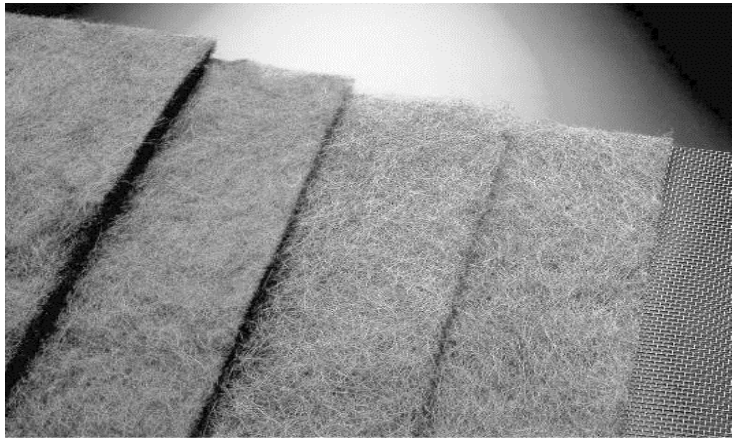
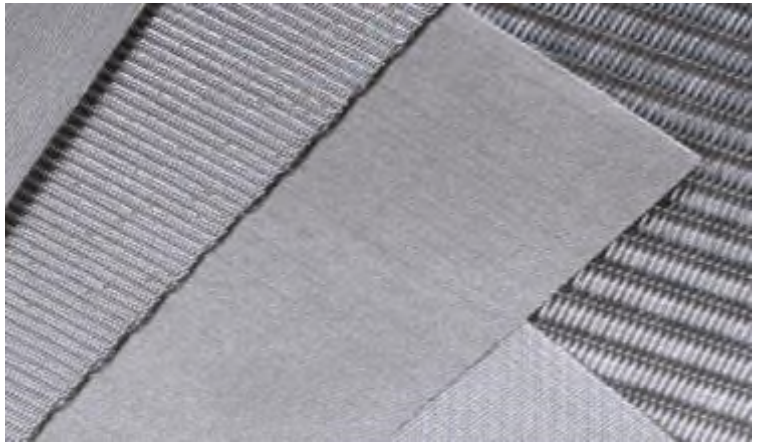
Filter Material

- Nonwoven fleece
  - High dirt holding capacity
  - Depth filtration for gel-particles
  - Narrow pore size distribution



- Woven fabrics
  - Surface (sieve-) filtration
  - Support for filter cake
  - Stainless steel or plastic



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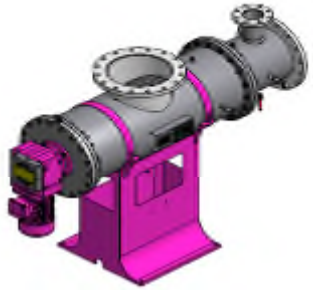
Dimensions



	OptiFil-050-0200	OptiFil-150-0270	OptiFil-150-0720	OptiFil-250-0720	OptiFil-350-1080
Length	610 mm	1 028 mm	1 484 mm	1 583 mm	2 034 mm
Width	571 mm	546 mm	546 mm	619 mm	727 mm
Height	2 002 mm	1 275 mm	1 275 mm	1 325 mm	1 360 mm
Power	-	0.75 kW	1.1 kW	1.1 kW	2.2 kW
Design pressure	16 bar	10 bar	10 bar	10 bar	10 bar

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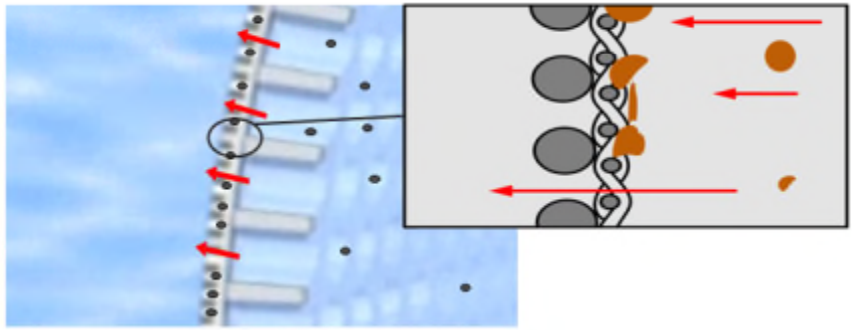
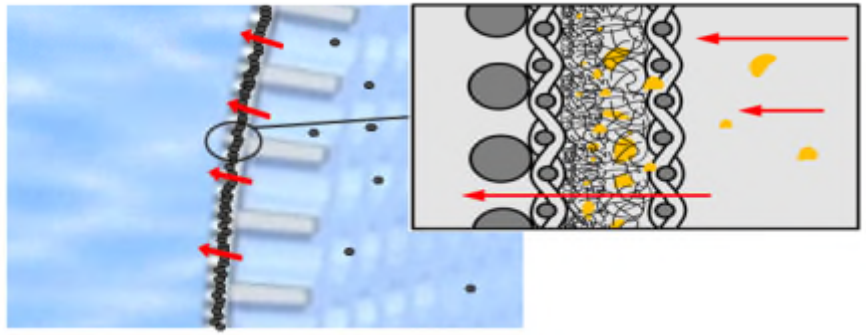
Operation Modes

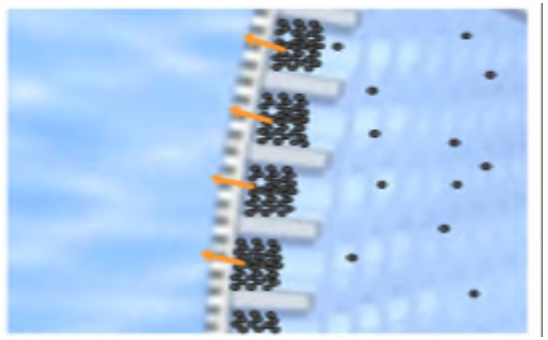
1. Backwash Filter



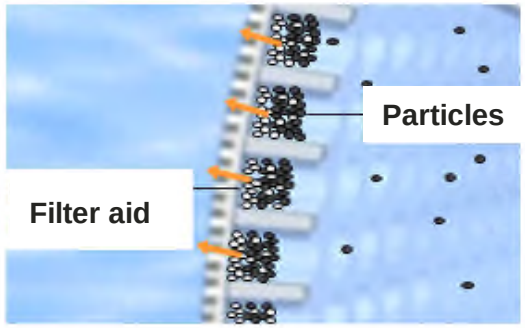
2. Depth Filter



3. Cake Filter

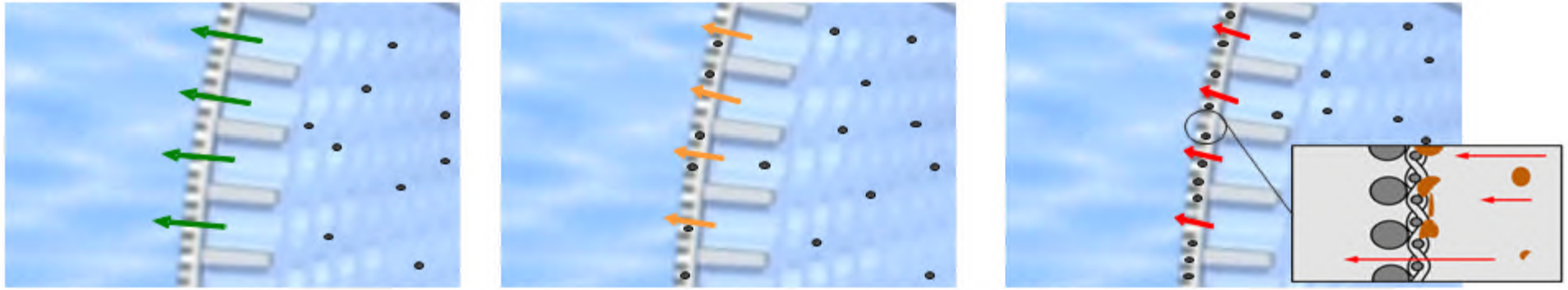


4. Precoat Filter



Lenzing OptiFil® as a Backwash Filter

Principle



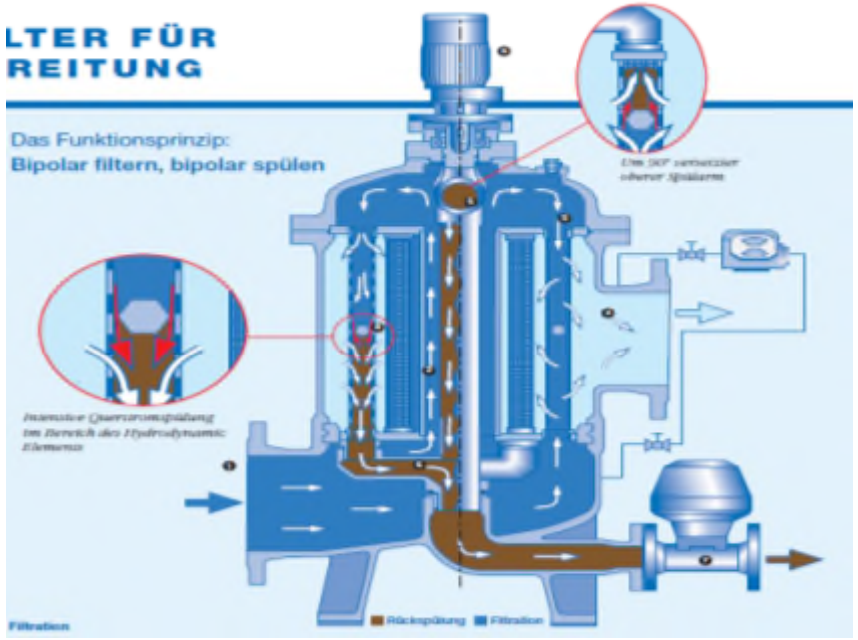
Physical principle of surface filtration

- Filter material: woven screen down to 5µm
- Competing Technologies:
  - Nozzle type backwash filters
  - Revolving candle type backwash filters

Lenzing OptiFil® as a Backwash Filter

Competing Brands

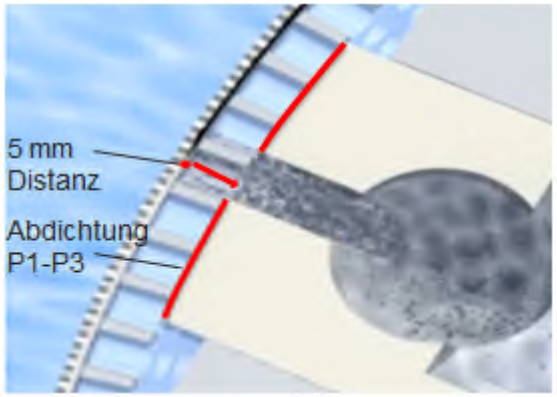
Boll



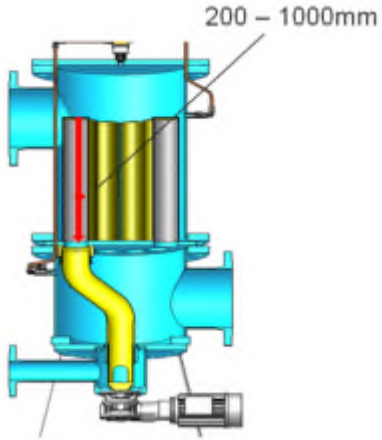
AMIAD

Lenzing OptiFil® as a Backwash Filter

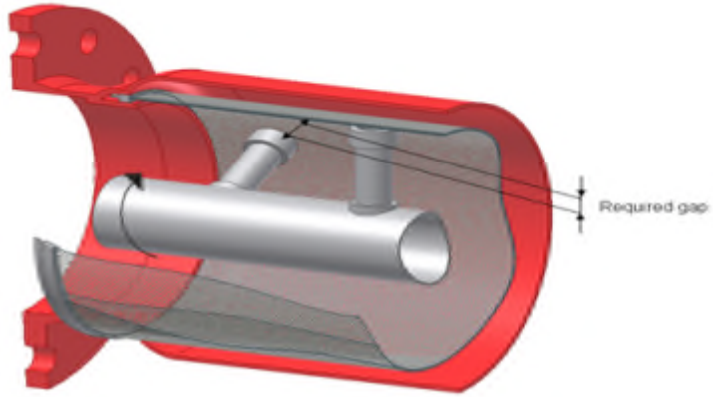
USP's of Lenzing OptiFil®



Lenzing OptiFil®



Candle filter



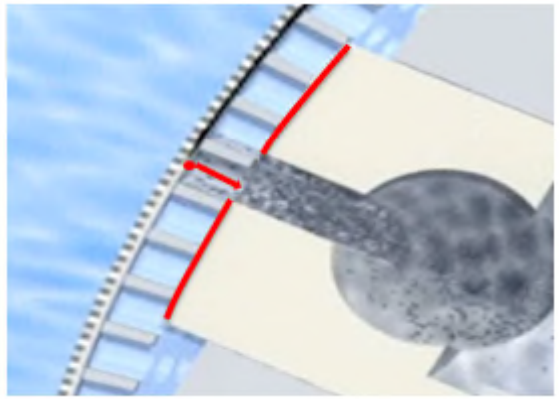
Nozzle filter

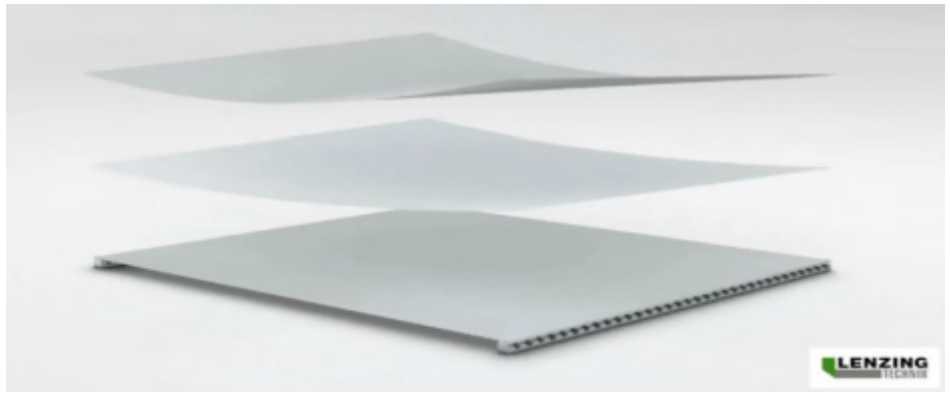
- Less reject
  - Short distance to flush particles out (5mm) → low backwash amount
  - Sealing between P1 (inlet) and P3 (reject) → no bypassing

→ **Finer filtration rating**

Lenzing OptiFil® as a Backwash Filter

USP's of Lenzing OptiFil®



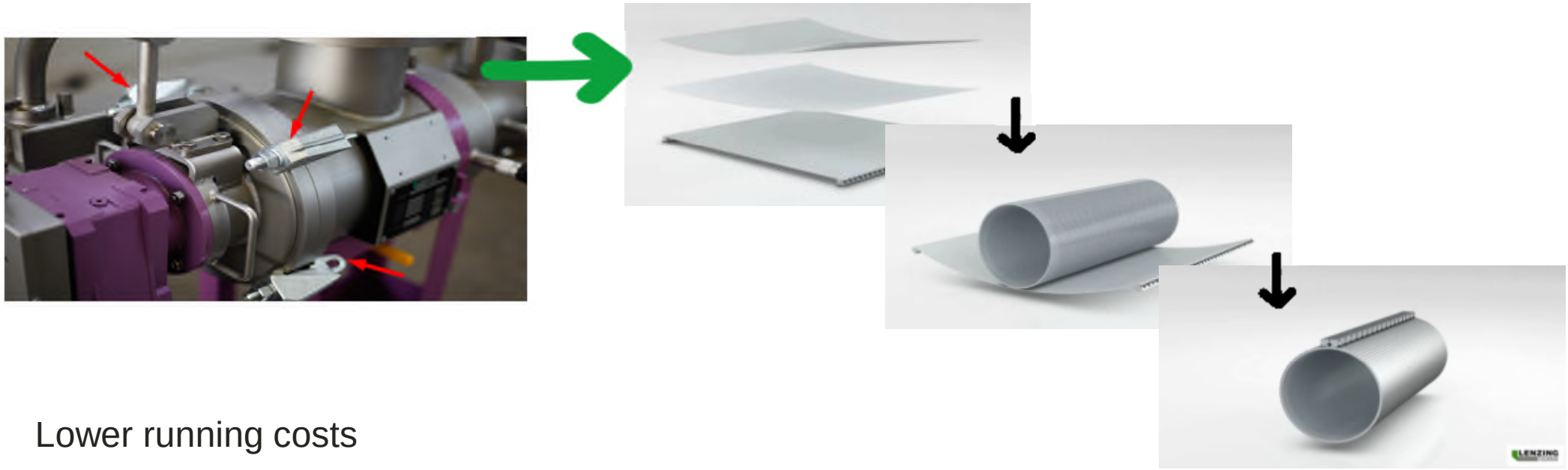


- Filter material lifetime:
  - Patented backwash without bypassing → efficient cleaning
  - Optimized sandwiching of filter material → any materials possible

→ **Enhanced filter material lifetime**

Lenzing OptiFil® as a Backwash Filter

USP's of Lenzing OptiFil®



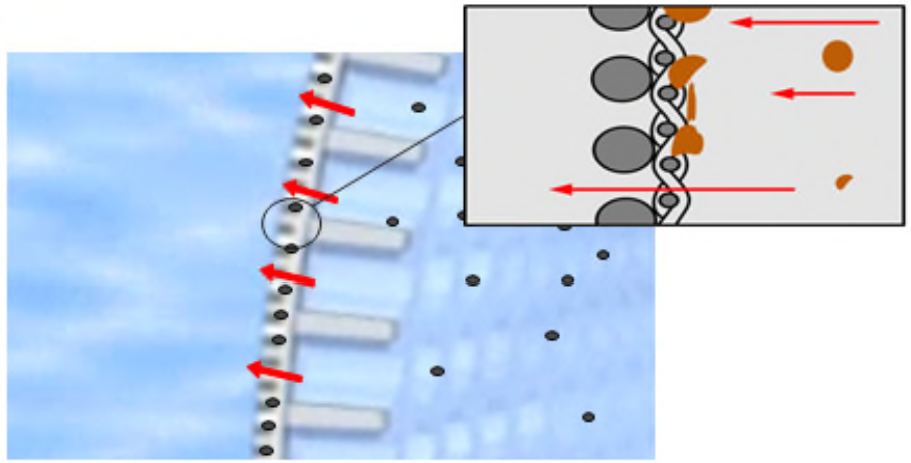
- Lower running costs
  - Single-layer flat sheet filter material → Low cost material applicable
  - "Quick-change" option → Fast filter material change

→ **Affordable and fast filter material change**

Lenzing OptiFil® as a Backwash Filter

Working Area

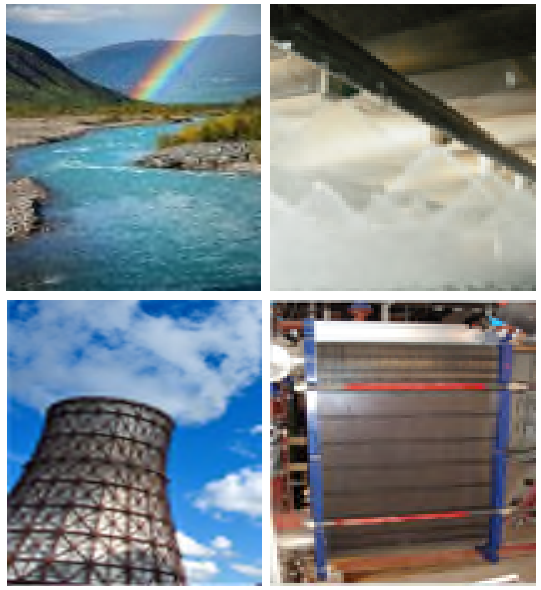
- High flow rates up to 1 500 m³/h per apparatus
- Filter fineness down to 5 µm
- Reject losses typically below 1 %
- Solid contents below 100 ppm
- Low viscosity
- Sieve filtration



Lenzing OptiFil® as a Backwash Filter

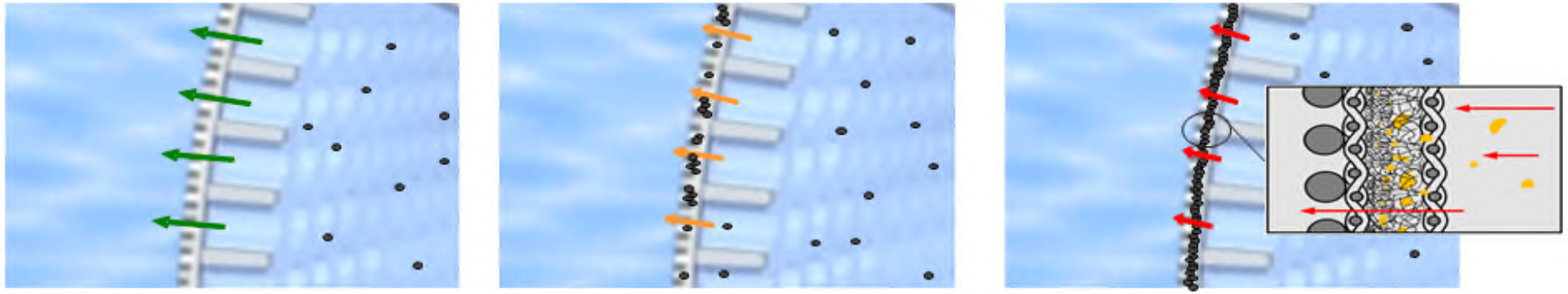
Typical Applications

- Well water
- River water
- Sugar refining
- Cooling water
- Aluminium seal bath
- Raw acid
- Heat exchanger protection
- Spray nozzle protection
- Produced water
- Processing baths in E-coat



Lenzing OptiFil® as a Depth Filter

Principle



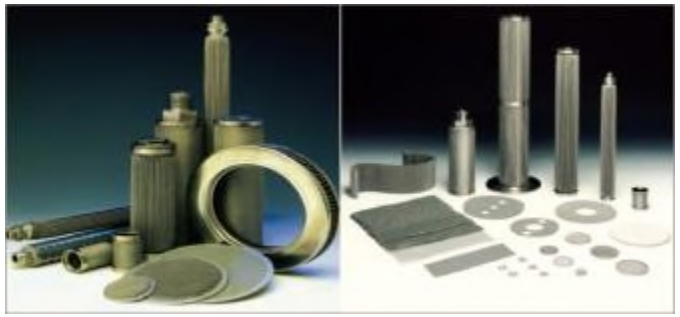
Physical principle of depth filtration

- Filter material: nonwoven fleece down to 3µm
- Competing technologies:
  - Sintered metal fiber candles
  - Plate and frame filter press dressed with felt or cellulose sheets

Lenzing OptiFil® as a Depth Filter

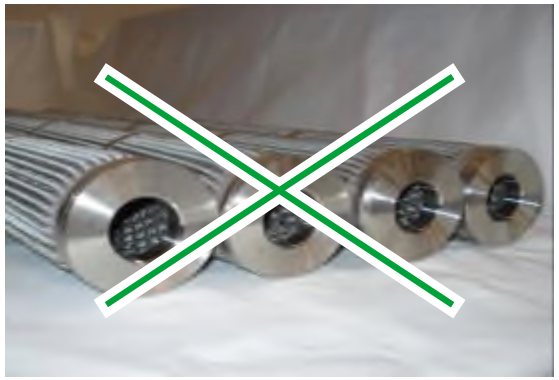
Competing Brands

Pall, Purolator, Fuji Filter, Paco, Hydac



Lenzing OptiFil® as a Depth Filter

USP's of Lenzing OptiFil®



- Automatic cleaning
  - No regular consumption of filter material or cartridges
  - No external manual cleaning
  - Automated *Cleaning In Place (CIP)* possible

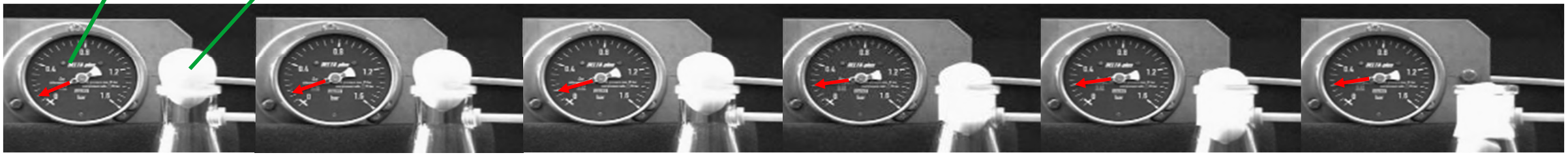
→ **Stable process without manual intervention**

Lenzing OptiFil® as a Depth Filter

USP's of Lenzing OptiFil®

Constant ΔP

Gel particle



0 sek	100 sek	200 sek

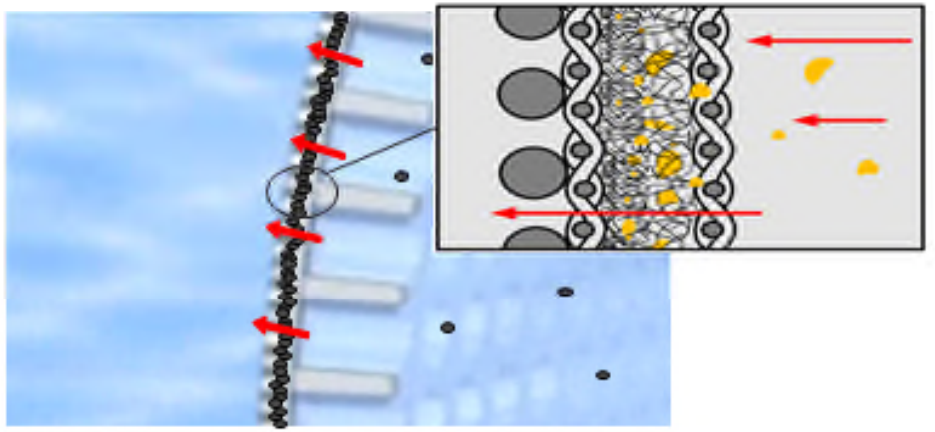
- Efficient for soft and gel type particles:
  - Nonwoven stainless steel fleece provides depth filtration effect
  - Adjustable interval between backwashes prevents gel particles from passing through filter material

→ **No migration of gel particles into the product**

Lenzing OptiFil® as a Depth Filter

Working Area

- Filter fineness down to 3 µm
- Gel particles have to be removed
- Solid contents below 500 ppm
- Medium to higher viscosity
- Depth filtration



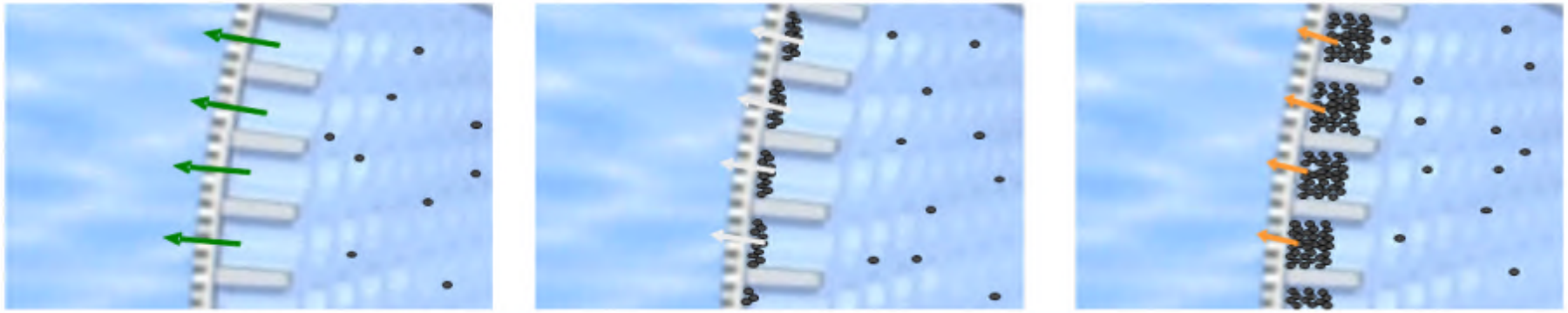
Lenzing OptiFil® as a Depth Filter

Typical Applications

- Polymer solutions for fiber spinning and film casting
- Clear paint for automotive applications (Final layer)
- Resin for paint production
- Starch filtration for additives in paper production
- Glues and other high viscose polymer solutions containing gel particles

Lenzing OptiFil® as Cake Filter

Principle



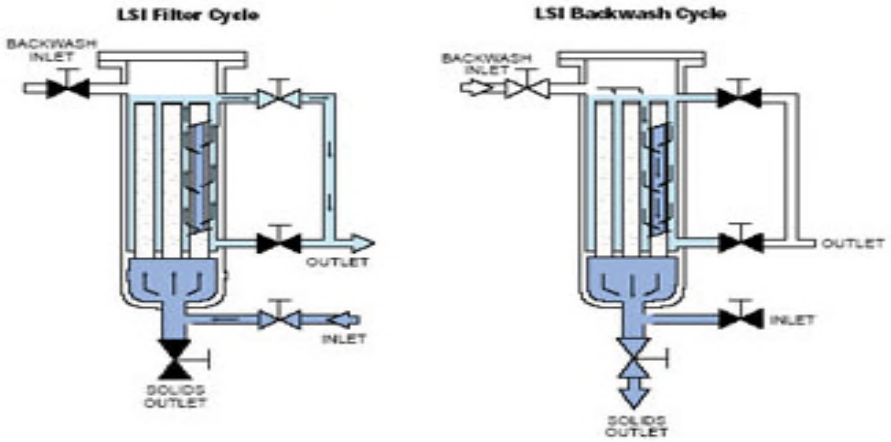
Physical principle of cake filtration

- Filter material: > 5µm woven screens → Filtration ratio down to 1µm
- Competing Technologies:
  - Fundabac®, Cricket® or other cake-building candle filters
  - Backpulse filtration, filter press, disposable systems

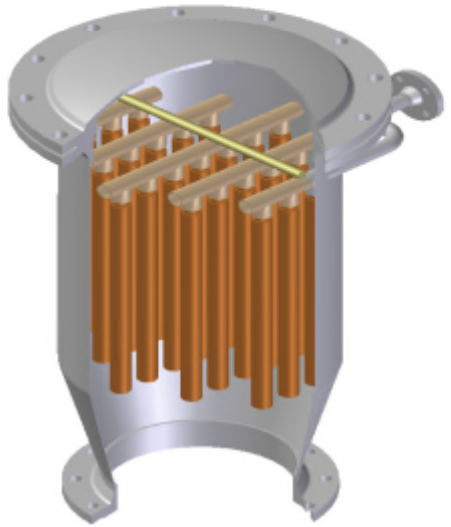
Lenzing OptiFil® as Cake Filter

Competing Brands

Mott



DrM



Lenzing OptiFil® as Cake Filter

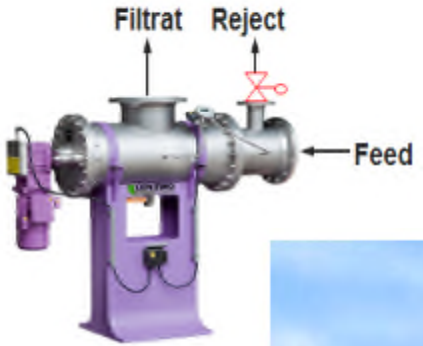
USP's of Lenzing OptiFil®

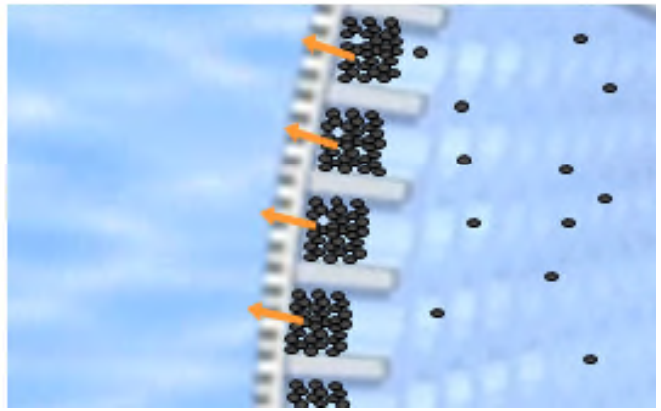
- Thin filter cake:
  - Very thin filter cake (typically <1mm) allows for filtration of fine particles
- Simple to install:
  - Most applications require only one automatic valve per OptiFil®
- Short regeneration time:
  - Very small hold up volumes
  - Small and nearly continuous reject stream → easier to treat
- Low investment:
  - Thin filter cake → smaller filter area required

Lenzing OptiFil® as Cake Filter

Working Area

- Up to 1 % solid content in the feed
- Filter fineness down to 1 µm
- Hard crystalline particles
  or fibres have to be removed
- Low to medium viscosity
- Cake filtration





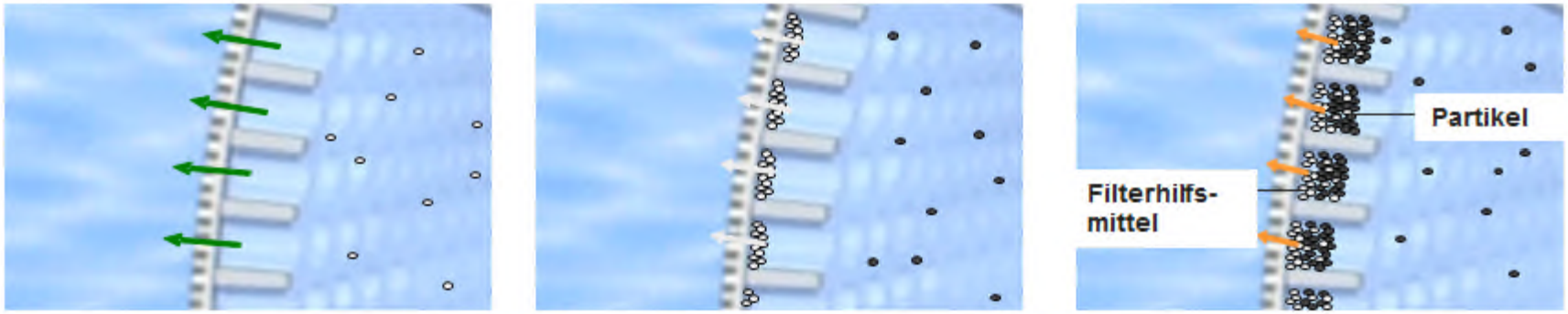
Lenzing OptiFil® as Cake Filter

Typical Applications

- Downstream polishing of belt-, disc- or drum filters or centrifuges
- Filtration of catalyst
- Boiler feed water (polishing after clarifier)
- Low concentrated fiber slurry from viscose steeping process
- Low concentrated fiber slurries in pulp and paper

Lenzing OptiFil® as Precoat Filter

Principle



Physical principle of cake filtration with filter aid

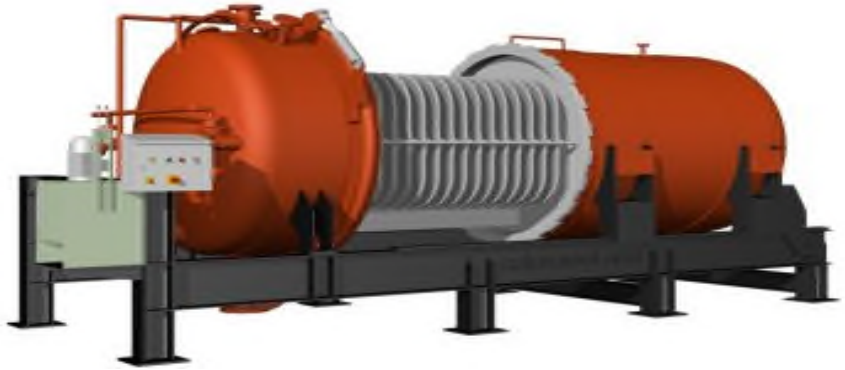
- Filter material: > 20µm woven screens → Filtration ratio down to 1µm
- Competing technologies:
  - Fundabac®, Cricket® or other cake building candle filters
  - Backpulse filtration, filter press, disposable systems

Lenzing OptiFil® as Precoat Filter

Competing Brands

DrM, BHS, Mahle

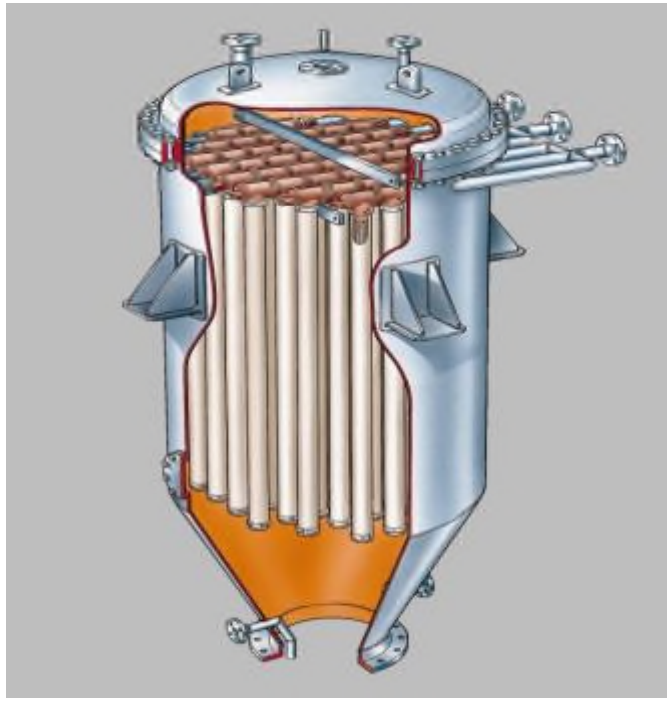
Mahle, Sparkler, Niagara



Lenzing OptiFil® as Precoat Filter

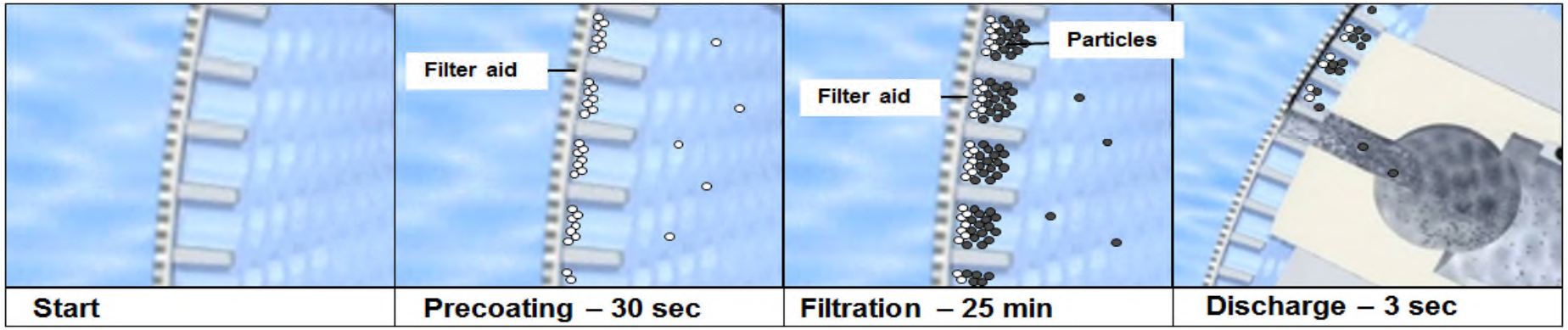
USP’s of Lenzing OptiFil®

- High reliability and no cake irruptions:
  - Thin filter cake does not tend to wrench
- Small plant footprint:
  - Space saving plant setup
  - Less hold up volumes



Lenzing OptiFil® as Precoat Filter

USP's of Lenzing OptiFil®

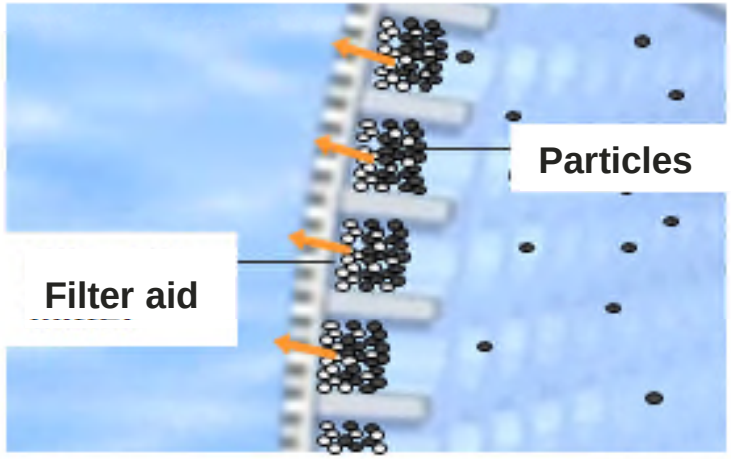


- Short precoating phase:
  - High flow velocity → no sedimentation effects → uniform precoat
    → Thin precoat → low filter aid consumption
- Low investment:
  - Simple automation

Lenzing OptiFil® as Precoat Filter

Working Area

- Low solid contents
- Filter fineness down to 1 µm
- Particles do not tend to form a filter cake
- Low to medium viscosity
- Precoat and / or bodyfeed possible



Lenzing OptiFil® as Precoat Filter

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Typical Applications

- Polishing of enzyme-based pharmaceuticals
- Polishing of starch
- Honing and cutting oil
- Used cooking oil

OptiFil®

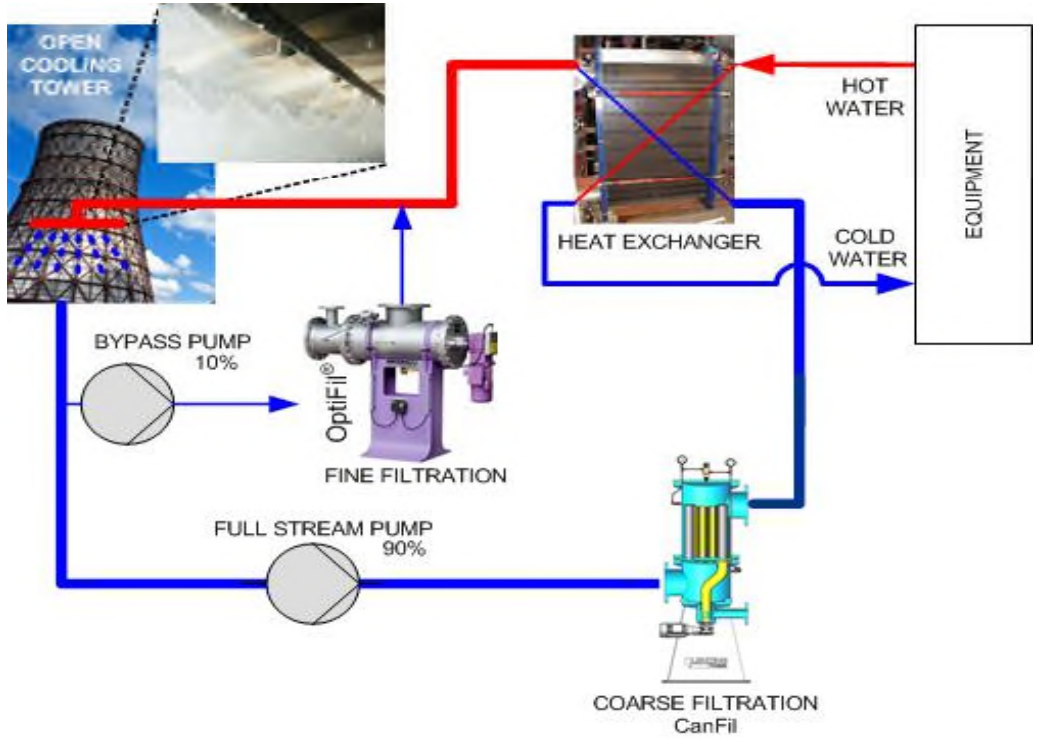
SELECTED APPLICATIONS

Selected Applications

Selected Applications Watertreatment

Cooling Water

- Fine filtration at 20 micron
- Simple system with low space requirements (compared to sand filters)
- Very low investment costs
- Low losses and therefore low additional water needs

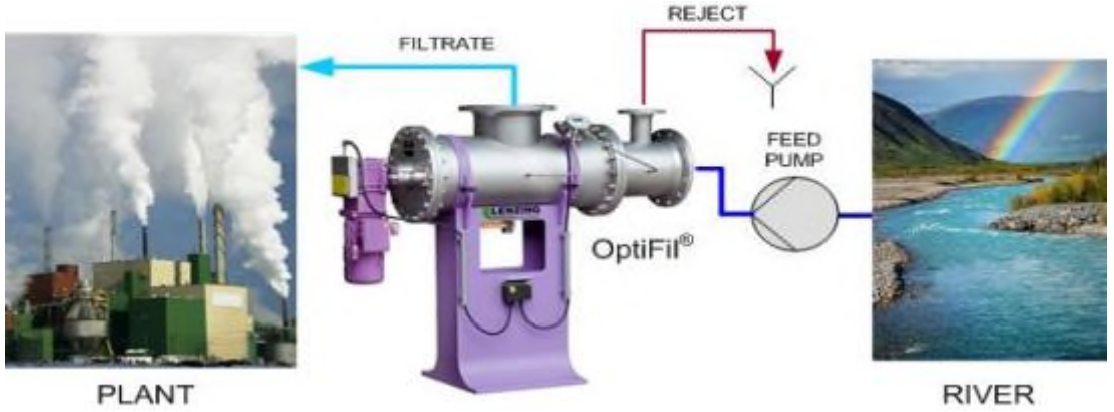


Selected Applications Watertreatment

LenzingTechnik

River Water Filtration

- Filter fineness of 20 µm
- High elimination of solids, especially of mussel larvae
- Very low reject amount (less than 0,5%) due to patented partial backwash
- Practically no running costs



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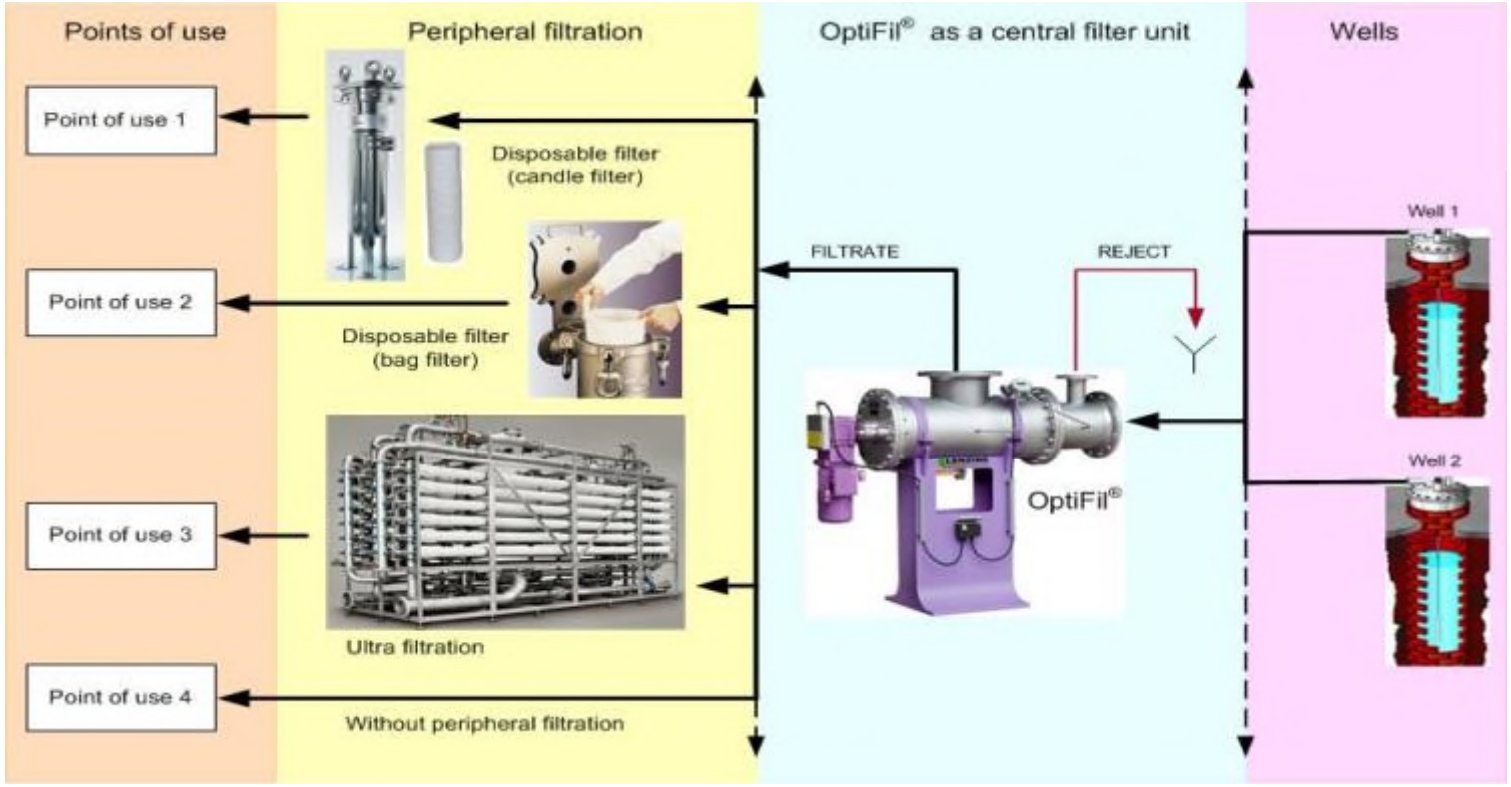
Selected Applications Watertreatment

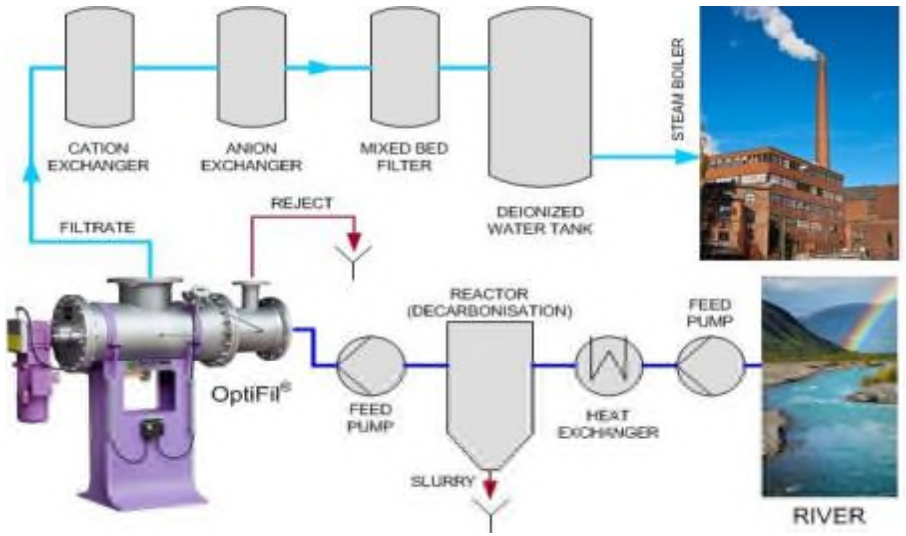
Well Water



Selected Applications Watertreatment

Boiler Feed Water

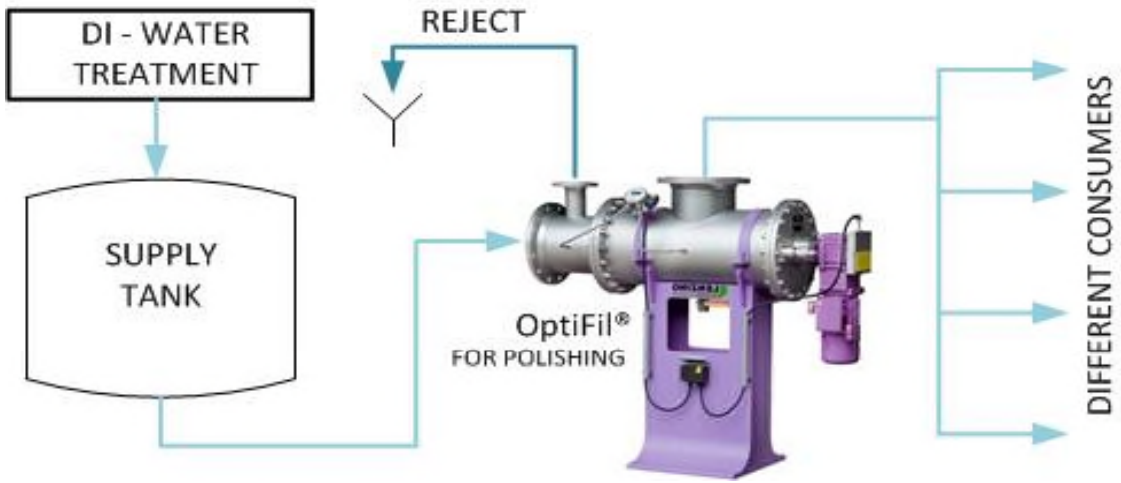
- High filter-fineness (95% of 2 µm) and flow rate (130m³/h and OptiFil-250-0720)
- 75% less reject compared to sand filter
- 50% less investment costs compared to sand filter
- 97% less building volume required



Selected Applications Watertreatment

DI Water Safety Filtration

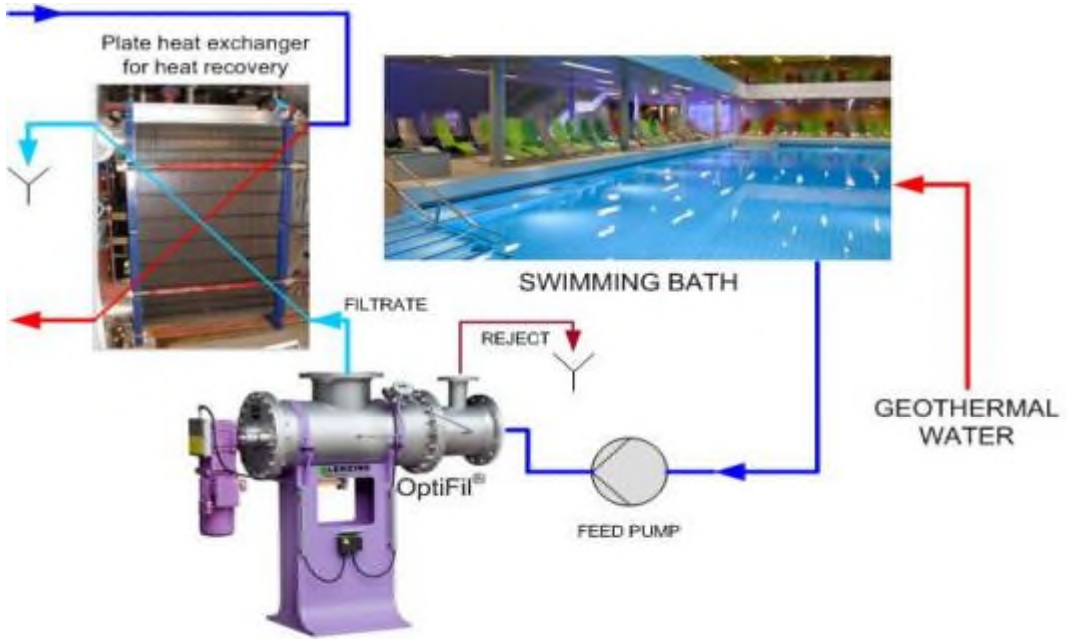
- Filtration at 10 micron
- Small foot print and low complexity
- No manual handling required
- Continuous operation due to partial backwash



Selected Applications Watertreatment

Thermal Bath Waste Water

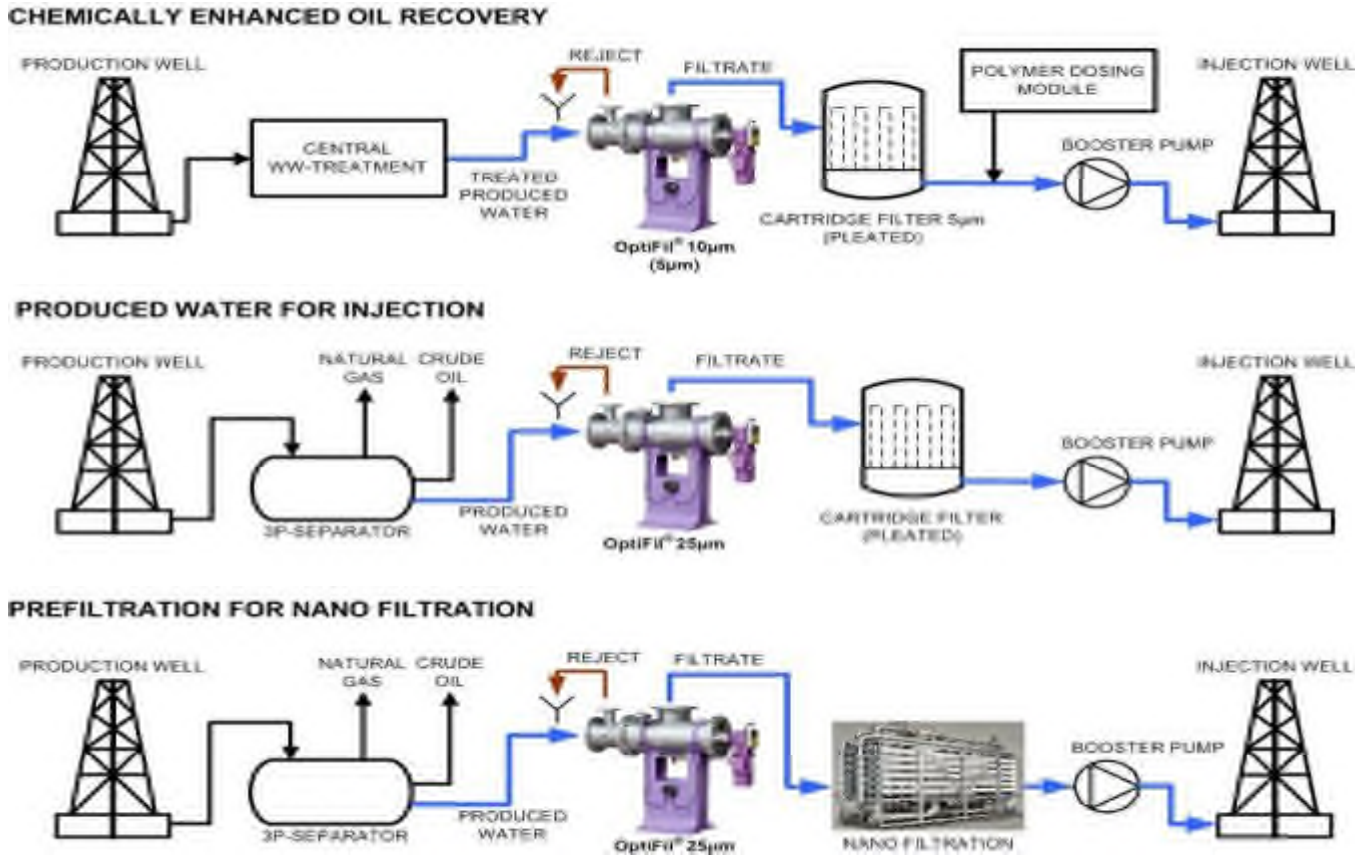
- Extension of operation interval – plate heat exchanger
- High flow of 250m³/h (OptiFil-250-0720)
- Low required building volume
- Practically no running costs



Selected Applications

Selected Applications Oil & Gas

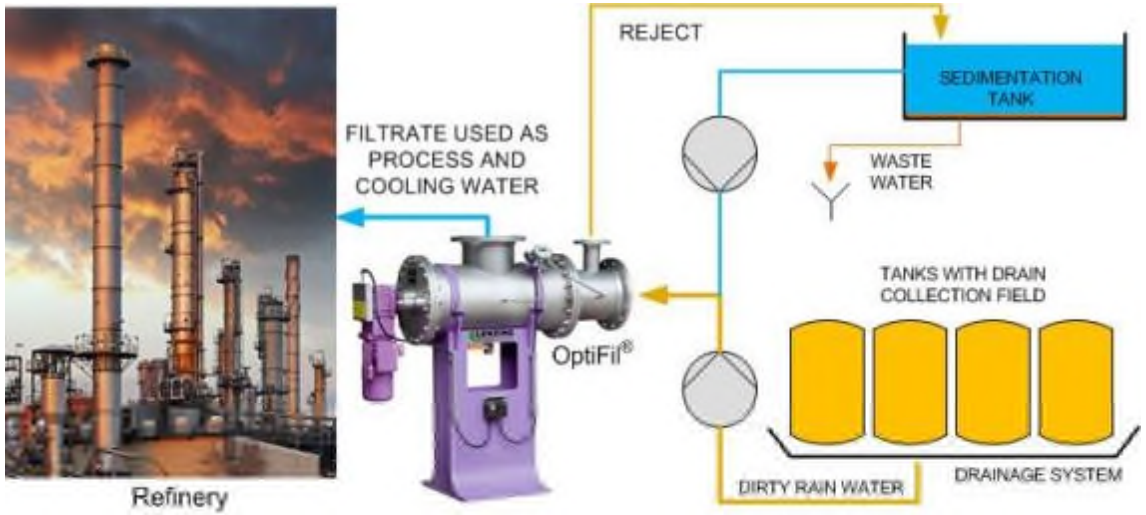
Produced Water



Selected Applications Oil & Gas

Drainage Water

- Fully automatic operation with only 1 automatic valve
- Lowest losses (which can be re-circulated)
- Fine filtration possible down to 5µm

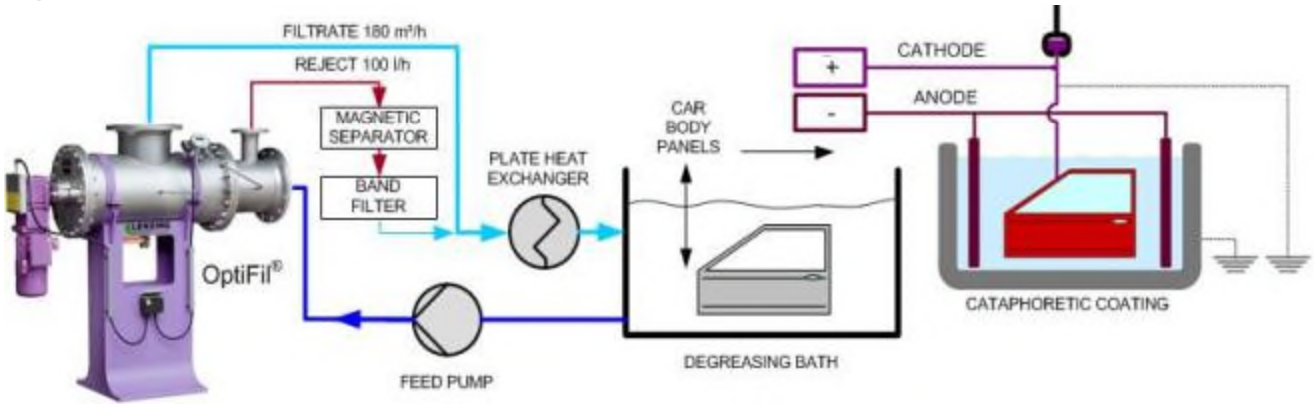


Selected Applications

Selected Applications Automotive Industry

Degreasing Bath

- High filter fineness through cake building inside the filter
- High filter material lifetime due to efficient backwash (patented) at lowest losses
- Usage of specific filter materials (prolonged lifetime despite fibers and glue)
- Easy and inexpensive change of flat, untailored filter material

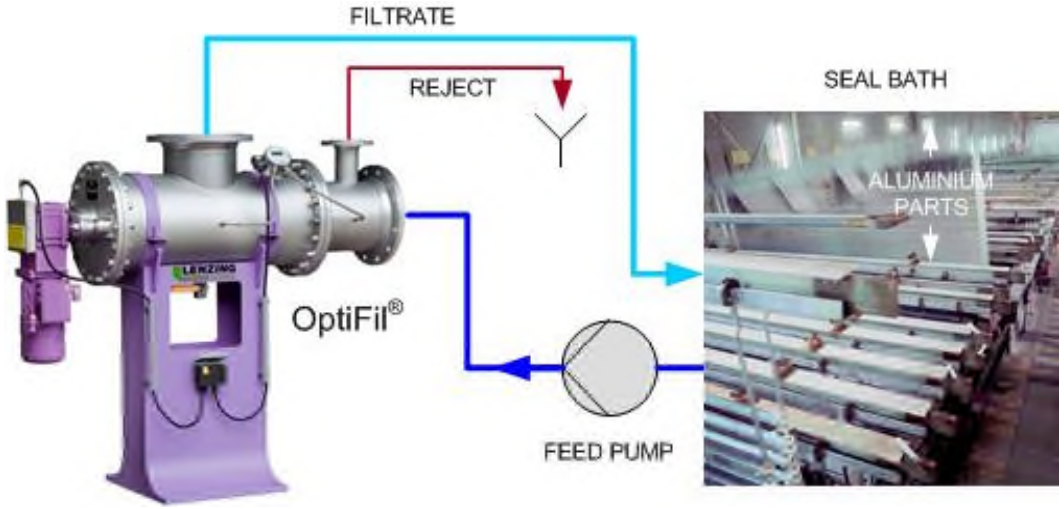


Selected Applications Automotive Industry

LenzingTechnik

Seal-Bath-Purification

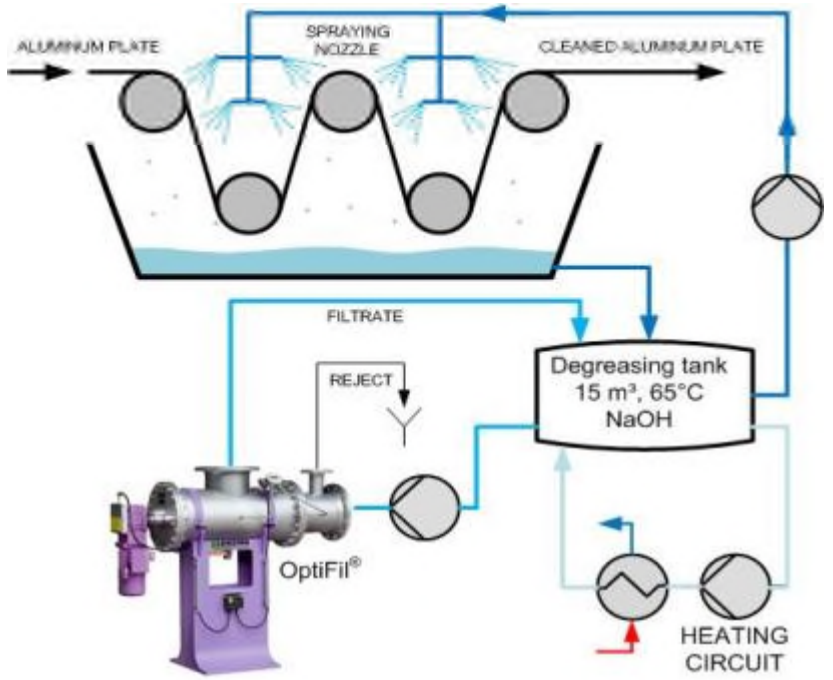
- High filter fineness (10µm-filter fabrics) and high flow rate of 130 m³/h per filter
- Followed by microfiltration still at flow rates of averagely 70 m³/h
- Very low backwash amount caused by patented backwash system
- High temperature resistance (100°C)



Selected Applications Automotive Industry

Aluminium Plate Degreasing

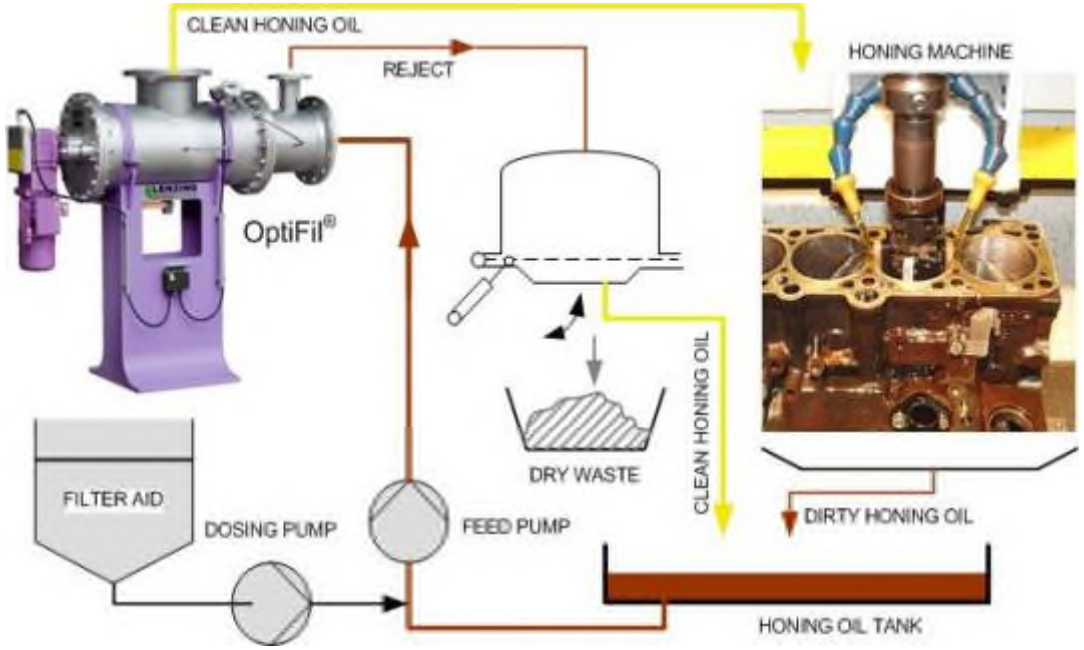
- Improved plate quality through particle removel in the bath
- Longer bath idle time and therefore less operating expenses
- Continuous operation with 1 apparatus possible (Partial backwash)



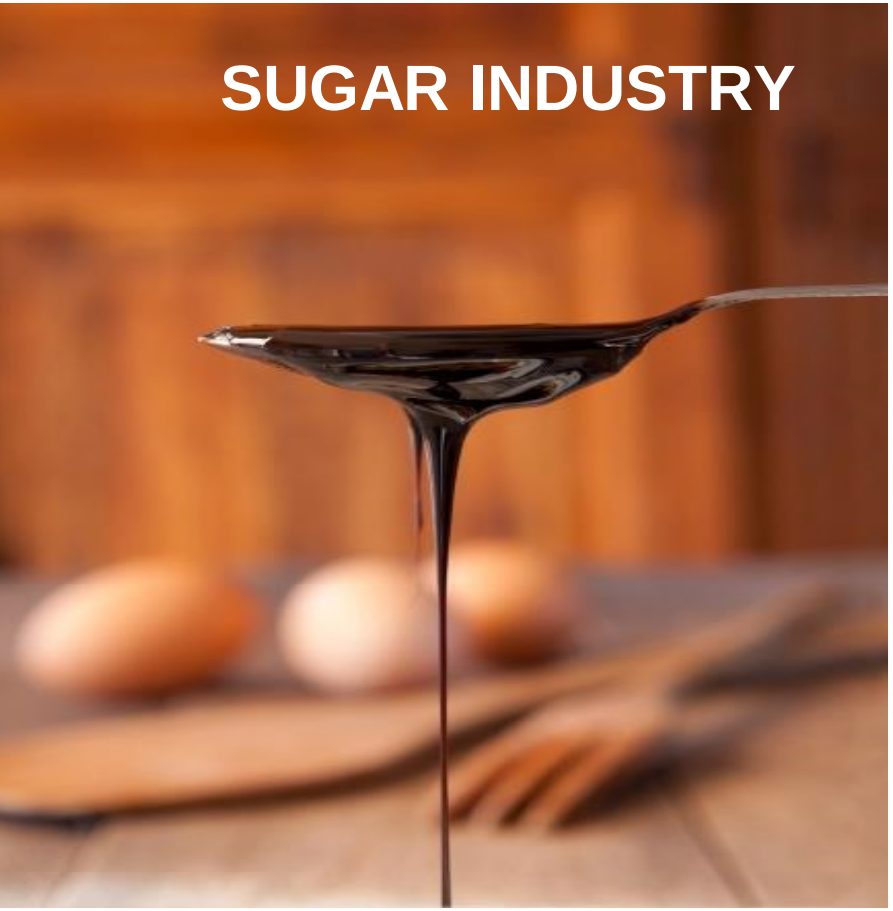
Selected Applications Automotive Industry

Honing Oil

- Extremely short regeneration time of the filter
- Lower filter aid consumption through more consistent and thinner precoating
- Lower tank volumes required for dirty and clean oil
- Very low operating expenses



Selected Applications

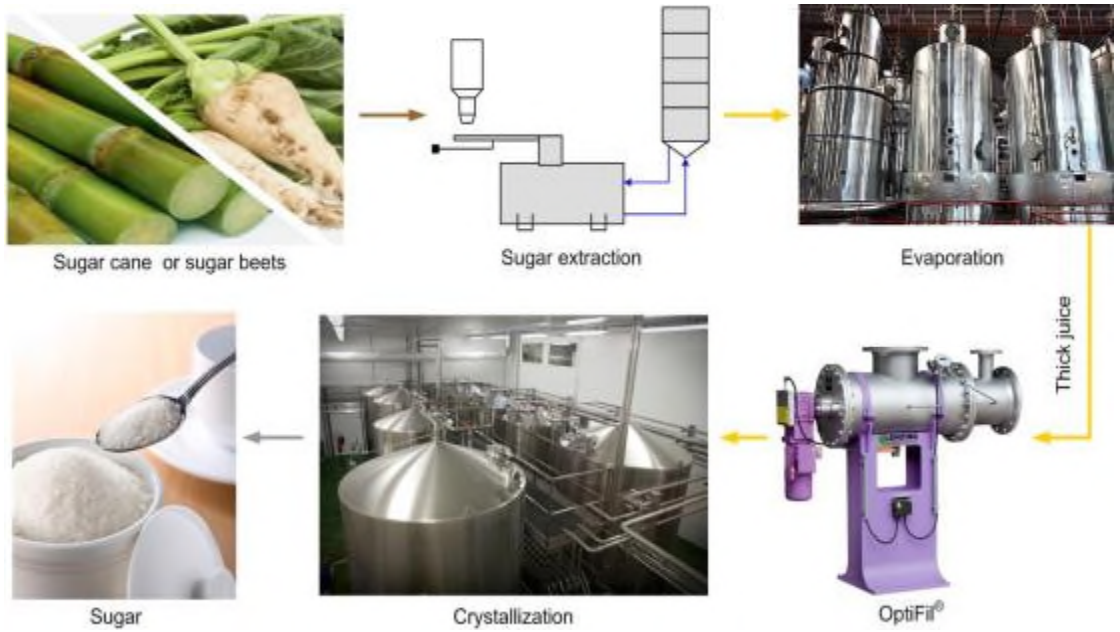


Selected Applications Sugar Industry

LenzingTechnik

Sugar Thick Juice

- Extremely low maintenance costs due to omission of filter aid (no consumables)
- Easy system construction with only one automatic valve per filter
- Lower installation volume required compared to candle filter systems
- Significant cost advantages in operation as well as investment



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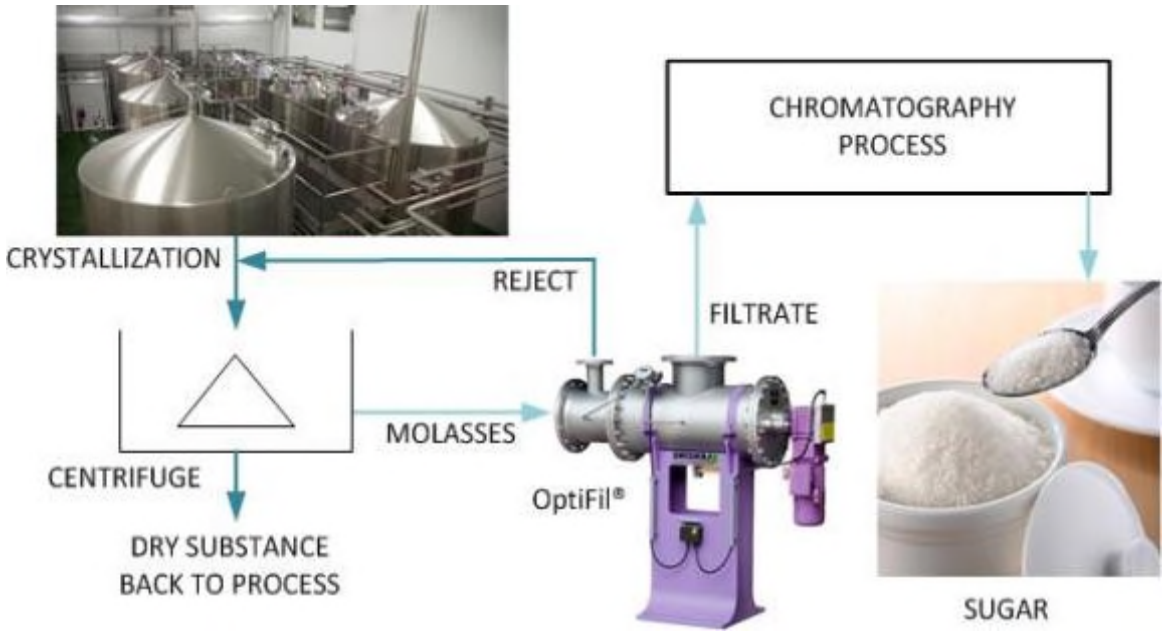
Innovative by nature

Selected Applications Sugar Industry

Molasses

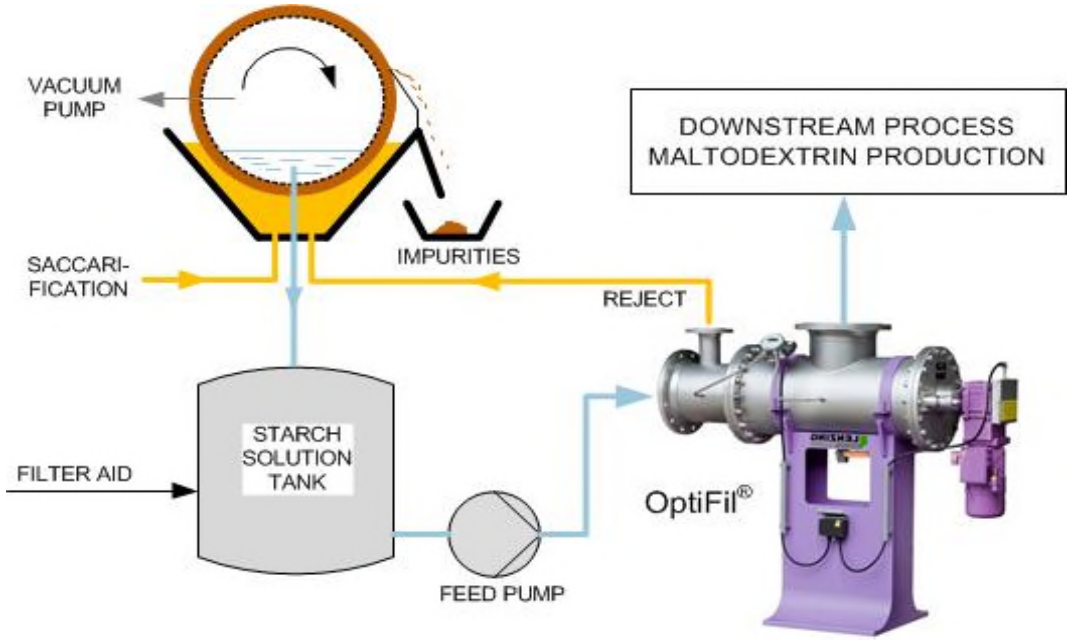
- Operation without filter aid possible (!)
  - ➜ Continuous filtration
- Low costs for investment and operation
- Simple system with only one automatic valve
- High filtrate quality through very fine fleece type filter material



Selected Applications Sugar Industry

Starch

- Low investment costs compared to precoat filters
- Space saving plant set-up
- < 5 Minutes from cake discharge to clear filtrate
- Short precoating and long filtration phase



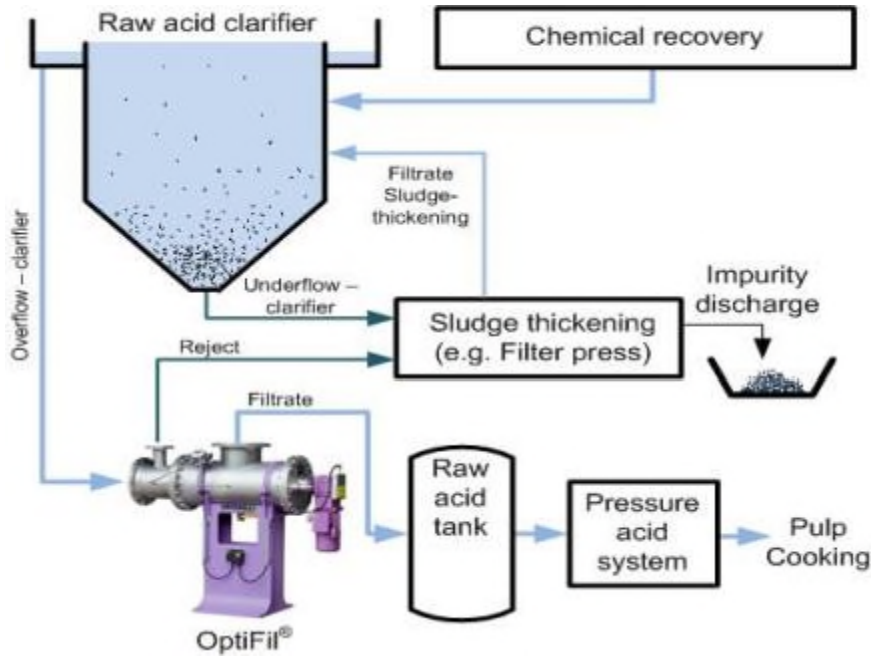
Selected Applications

LenzingTechnik

Selected Applications

Raw Acid – Pulp Industry

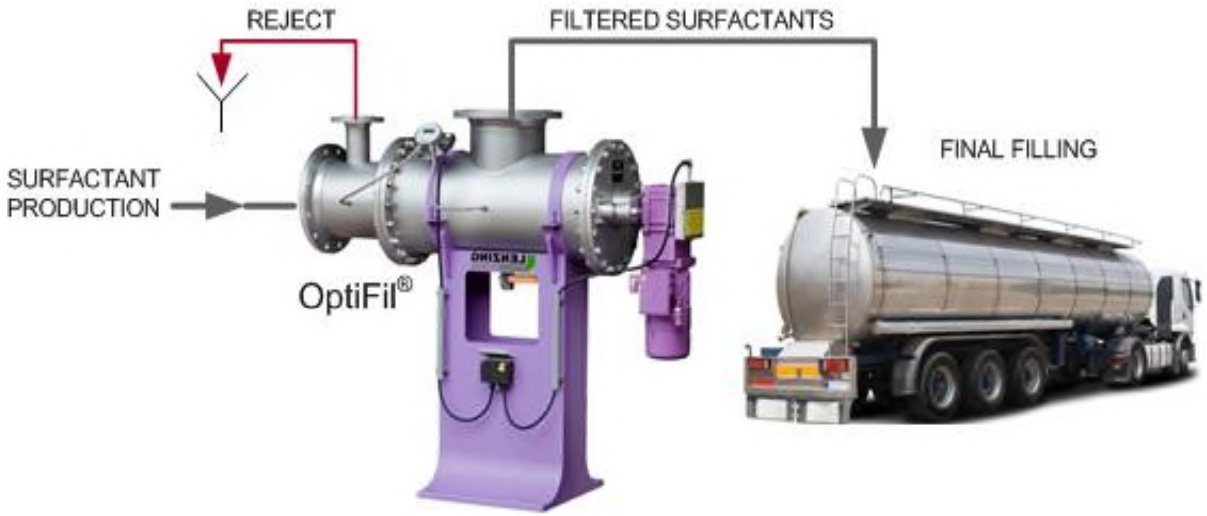
- High filter fineness of 25µm with filter fabrics
- Very low backwash amount, which can be re-circulated to clarifier
- Exzellent filtrate quality resulting in improved end product quality
- Completely closed system no emission of acid



Selected Applications

Biologically Degradable Surfactants

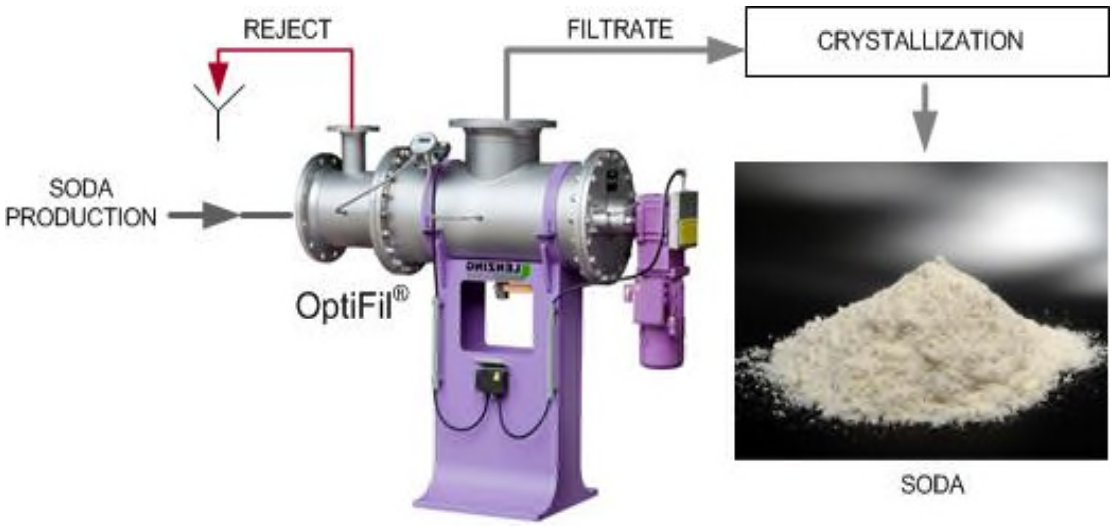
- High filter fineness of 10µm with filter fabrics
- Very low backwash amount of about 5-10 litres per backwash
- Practically no running cost
- Completely closed system



Selected Applications

Soda Solution

- Higher filter fineness than sand filter
- Very low backwash amount (waste)
- Lower required building volume than sand filters
- More hygienic processing than sand filter (food grade product)



Selected Applications

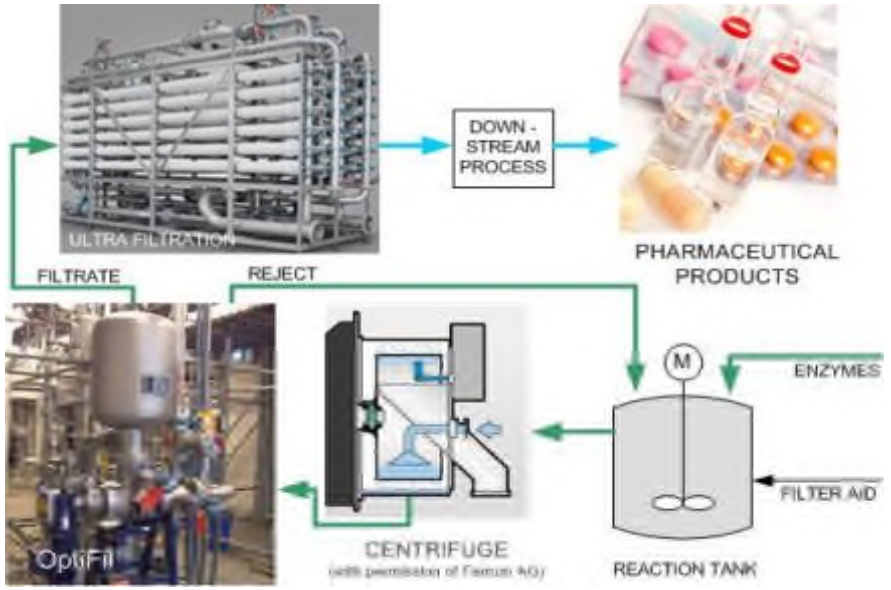
Used Cooking Oil

- Very low running costs
- Minimum total investment cost
- Low required building volume
- Easy installation and handling

Selected Applications

Pharmaceutical (Enzymatic Broth)

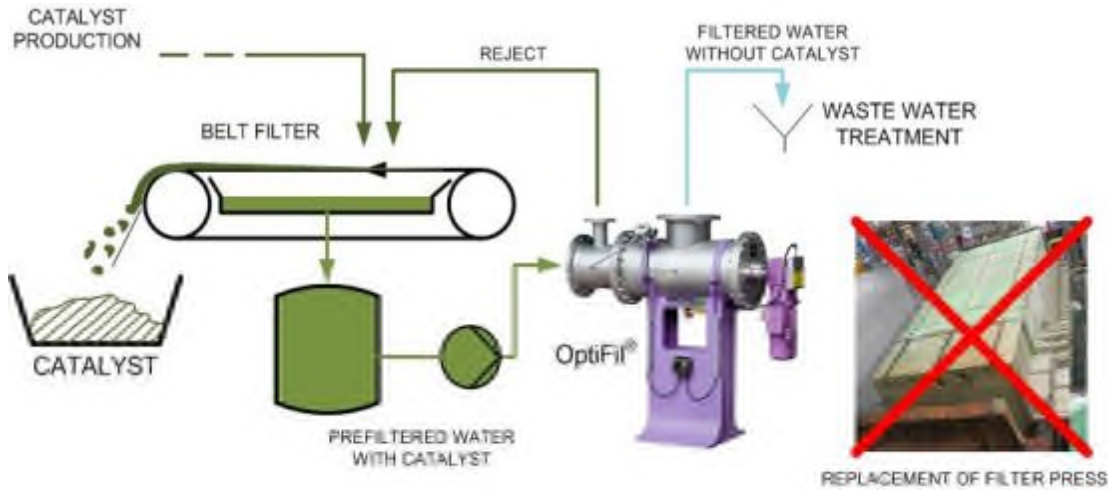
- Required filter fineness of 10µm (cake support)
- Flow rate increase of downstream ultra filtration from 50-100L/h → 800L/h
- Nearly loss-free operation
- Completely closed, continuous system without odour development



Selected Applications

Catalyst Recycling

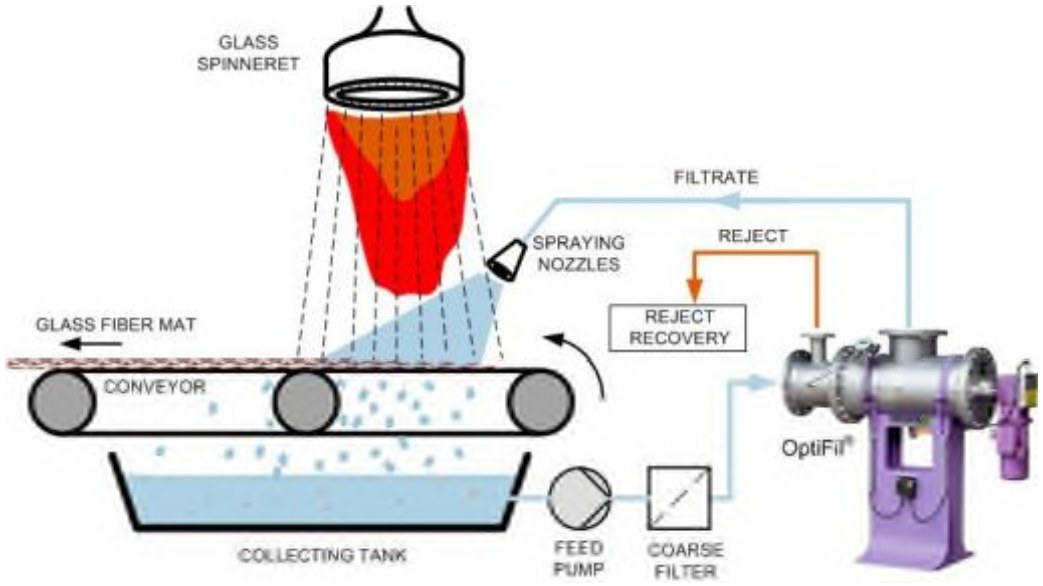
- Completely closed system – no risk of emission of dangerous product
- Recovery of non-soluble Nickel in the wastewater stream up to 99%
- Filter fineness of 5µm and lower through thin-cake filtration
- Fully automatic CIP – minimum manual operation necessary



Selected Applications

Glas Fiber Spinning

- Completely closed system
- Fully automatic CIP – minimum manual operation necessary
- Assured protection of spray nozzles
- Improved glass fiber quality due to fine filtration



Selected Applications Lenzing OptiFil ®

- OptiFil® for COOLING WATER
- OptiFil® for RIVER WATER
- OptiFil® for WELL WATER
- OptiFil® for BOILER FEED WATER
- OptiFil® for DI WATER
- OptiFil® for THERMAL BATH WATER
- OptiFil® for DRAINAGE WATER
- OptiFil® for PRODUCED WATER
- OptiFil® for DEGREASING BATHS
- OptiFil® for SEAL BATH PURIFICATION
- OptiFil® for ALUMINIUM DEGREASING
- OptiFil® for HONING OIL
- OptiFil® for SUGAR THICK JUICE
- OptiFil® for MOLASSES
- OptiFil® for STARCH SOLUTION
- OptiFil® for RAW ACID
- OptiFil® for SURFACTANTS
- OptiFil® for SODA SOLUTION
- OptiFil® for USED COOKING OIL
- OptiFil® for PHARMACEUTICALS
- OptiFil® for CATALYST RECYCLING
- OptiFil® for GLASS FIBER SPINNING

Selected References Filtration & Separation

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Smart solutions to drive your results

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