

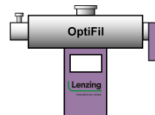


Application Report

Automotive Industry

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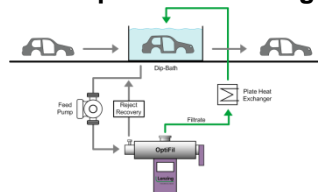
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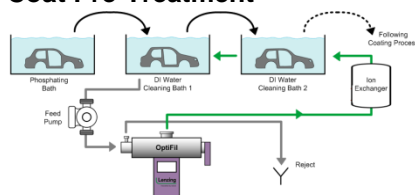
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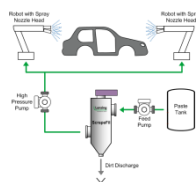
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Lenzing OptiFil®

Benefits:

- Fully automatic system
- Surface (fabric) or depth filtration (fleece)
- Minimum losses (patented regeneration system)
- Space-saving plant setup
- Simple and easy to install (one automatic valve per filter)
- Filter fineness down to 3µm (fleece), 5µm (woven fabric), 1µm (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)

Operating principle:

The patented Lenzing OptiFil® is a fully-automatic, continuous system that works according to the principle of surface, depth or cake filtration. A metal fiber fabric or fleece is used as filter material, which retains particles of different sizes either inside or on its surface. After the pre-determined degree of contamination has been reached, the filter material is cleaned by backwashing a small quantity of filtered medium. The backwash of the impurities is executed by the reject device within the filter. Filtration is possible down to 3µm with fleece, 5µm with metal fabric and microfiltration below 1µm with cake formation.

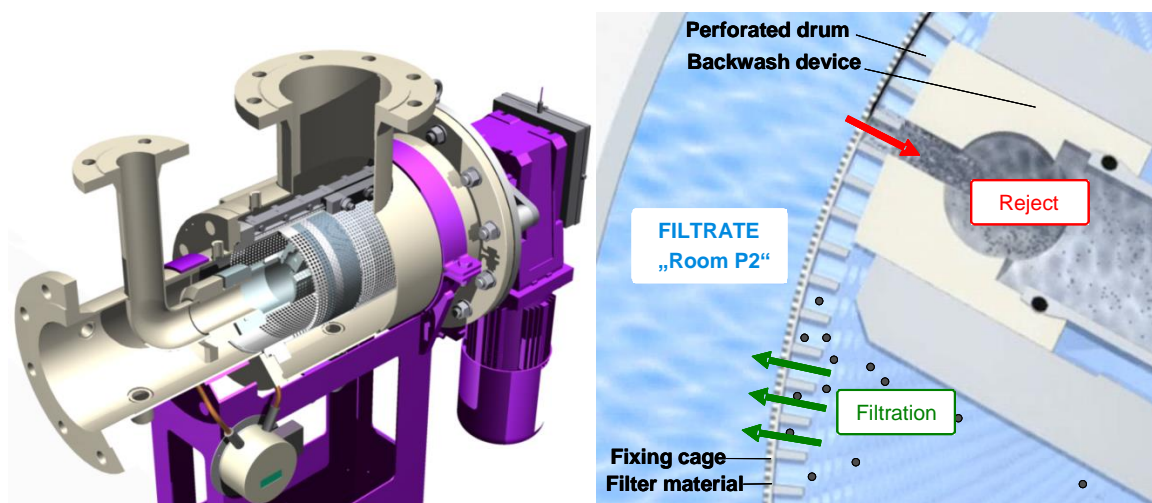


Figure 1: Operating principle Lenzing OptiFil®

Wedge wire filter ScrapeFil

Benefits:

- Fully automatic system
- Filter fineness down to 50µm
- No pre-filtration needed
- Simple and robust design

Operating principle:

The Scraper filter Lenzing ScrapeFil is a fully automatic system that works according to the principle of surface filtration. The unfiltered media gets into the filter housing and is filtered from outside to inside of the filter candle. Depending on the requirements, the filter candle can turn continuously or just when an adjustable differential pressure is reached, or via time. A fixed scraper plate is pre-stressed to the candle surface and scrapes the impurities off. The removed particles settle down to the bottom of the housing and are discharged by a time controlled automatic valve mounted on the bottom.

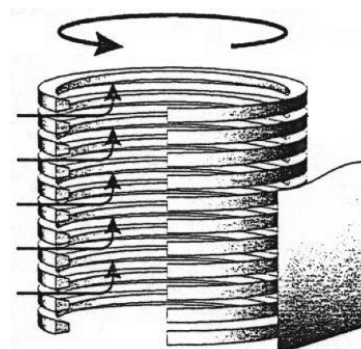
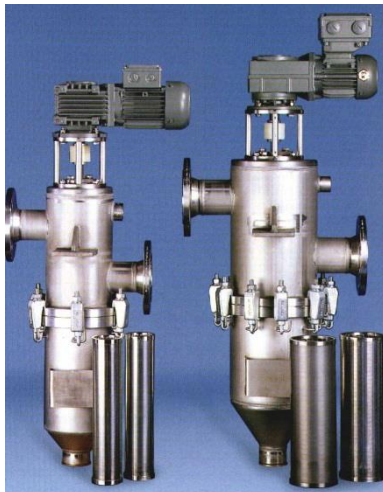


Figure 2: Operating principle ScrapeFil

Case Study Degreasing-Bath-Filtration in Cataphoretic Painting



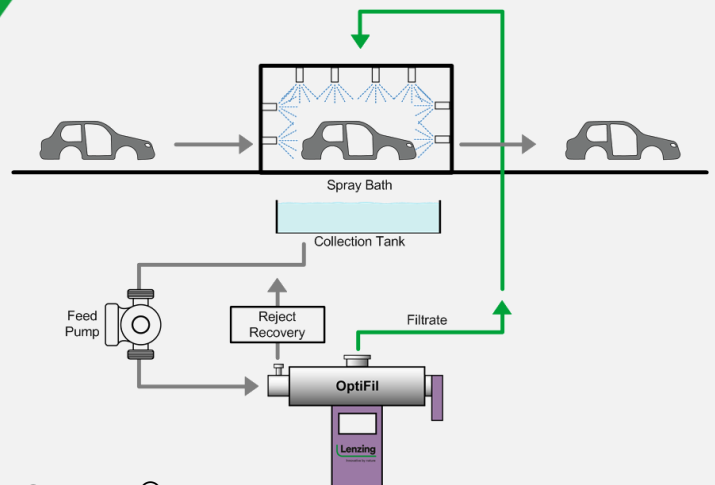
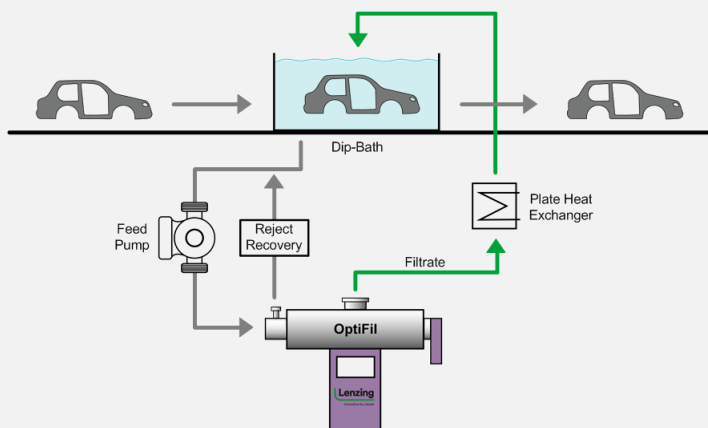
Problem Conventional Filtration

- Particles on finished car bodies
 - Glue residues, weld pearls, ...
- Manual effort within post-treatment processes



Ideal State

- High-quality E-coating
- No post-treatment necessary
- Low consumption-rate of chemicals



Solution Lenzing OptiFil®

Filtration of degreasing baths (e.g. in the pre-treatment of cataphoretic painting of car body parts) with automatic backwash-filter

Lenzing OptiFil®

- High filter fineness at lowest reject quantities
- Filtration also possible for light and non-magnetic particles
- Economic filtration with high circulation volumes (35 – 360 m³/h per filter)
- Significant reduction of service efforts for the plate heat exchangers



Case Study Degreasing-Bath-Filtration in Cataphoretic Painting

Car Manufacturer in Germany

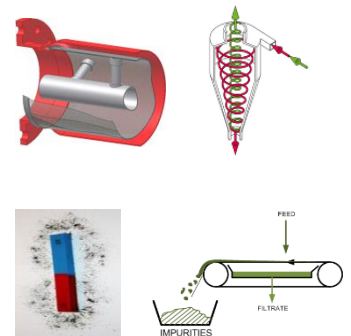
A leading German car manufacturer with high quality standards operates several cataphoretic painting facilities for finishing complete car bodies. Prior to varnishing, the bodies are cleaned in multi-stage degreasing and rinsing baths.

The required heating of the degreasing baths is done by a plate heat exchanger. Due to their geometry and the diversity of impurities in the baths, the heat exchangers blocked on a regular basis, hence requiring labour-intensive manual services.

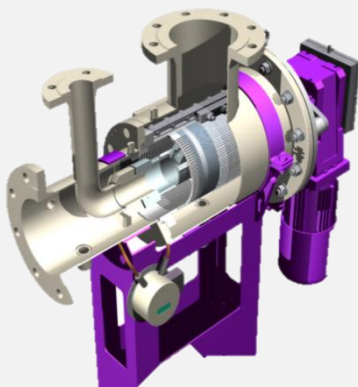
A further problem is represented by carrying on of dirt from the rinsing baths to the painting area, whereby the share of fibers and non-hardened glue are particularly problematic.

Conventional Filtration

- Cyclones:** are only able to separate heavyweight dirt particles, but no lightweight particles, etc.
- Magnetic separator:** capable solely of separating ferritic metal particles
- Suction band filter:** suitable only for very low flow rates. Bath care for nearly 100m³ cannot be economically realized.
- Backwash filter:** all previous trials failed because of too high reject quantities, which would have emptied the bath within several hours. Additionally, blocking with fibers and glue led to high maintenance efforts.



Lenzing Filtration Filter System OptiFil®



The patented Lenzing OptiFil® is a fully automatic, continuous system that works according to the principle of depth, surface or cake filtration. A fiber fabric or fleece is used as filter material which retains particles of different sizes either inside or on its surface.


After the pre-determined degree of contamination has been reached, the filter material is cleaned by backwashing a small quantity of filtered medium. The backwash of the impurities is executed by the reject device within the filter. During the regeneration process, filtration continues.

Filtration is possible down to 3µm with fleece, to 5µm with fabric and microfiltration below 1µm with cake formation.

Applications OptiFil®


The Lenzing OptiFil® is used for fine and microfiltration of particles from low- and medium-viscosity media.

Case Study DI-Water-Filtration in E-Coat Pre-Treatment



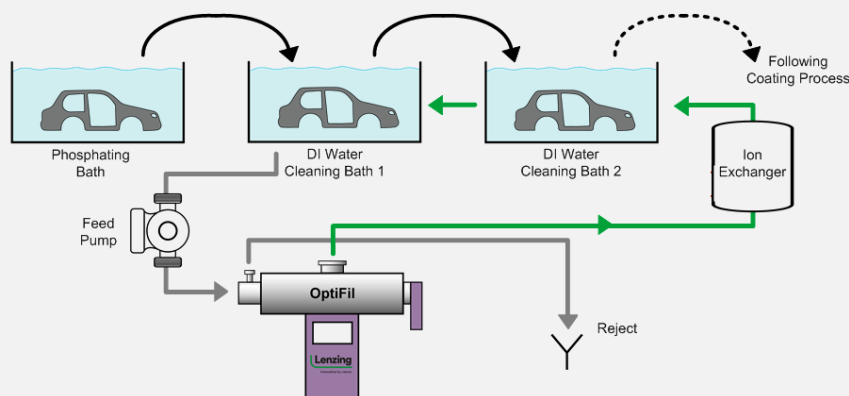
Problem Conventional Filtration

- Phosphating slurry on car bodies
- Blocking of ion exchangers
- Infiltration of particles



Ideal State

- Highest product quality
- Solid-free cleaning-circuits
- Nearly maintenance-free operation



Solution Lenzing OptiFil®

Filtration DI water cleaning bath upstream ion exchangers
in a car body production with automatic backwash-filter

Lenzing OptiFil®

- Small set-up area
- Low investment and operating costs
- Very fine filtration rating (10µm) at small reject quantities
- No manual change of disposable filter elements, fully automatic system



Case Study DI-Water-Filtration in E-Coat Pre-Treatment

Car Body Manufacturer in China

A leading German car manufacturer with high quality standards operates a cataphoretic painting facility for finishing of complete car bodies in China. For purification of one of the pre-treatment baths prior to the cataphoretic dip coating (e –coat), the backwash filter OptiFil® has been installed.

General Requirements:

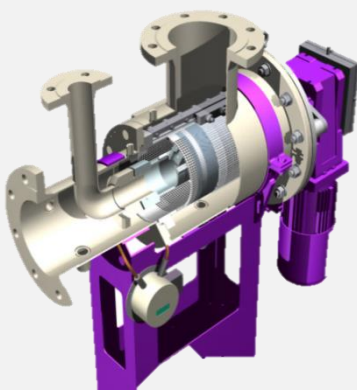
One of the pre-treatment steps prior to cataphoretic coating is the phosphating process. In a downstream bath, the car bodies are cleaned with DI water in a multistage process. Chemicals that are carried over from the phosphating bath lead to a salting of the downstream purification baths. To prevent this salting, the media is treated in a bypass flow with ion exchangers. In order to protect these ion exchangers, the media is filtered with the automatic backwash filter OptiFil®.

Conventional Filtration

In conventional filter processes of cleaning baths disposable filters are used. These single-use filters such as bag or cartridge filters require frequent change of the respective elements. This results in high costs for the elements themselves, the disposal as well as the working time for the manual change.



Lenzing Filtration Filter System OptiFil®



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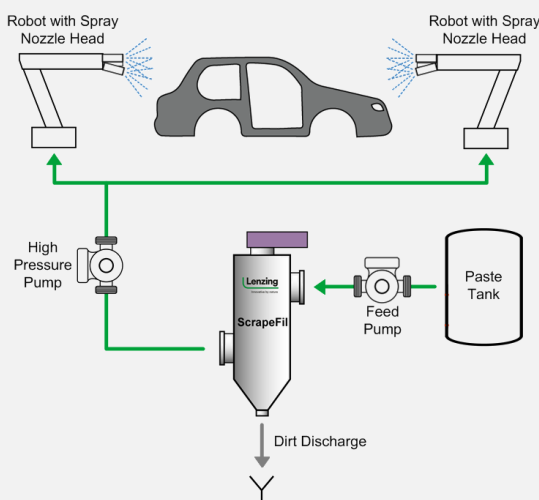
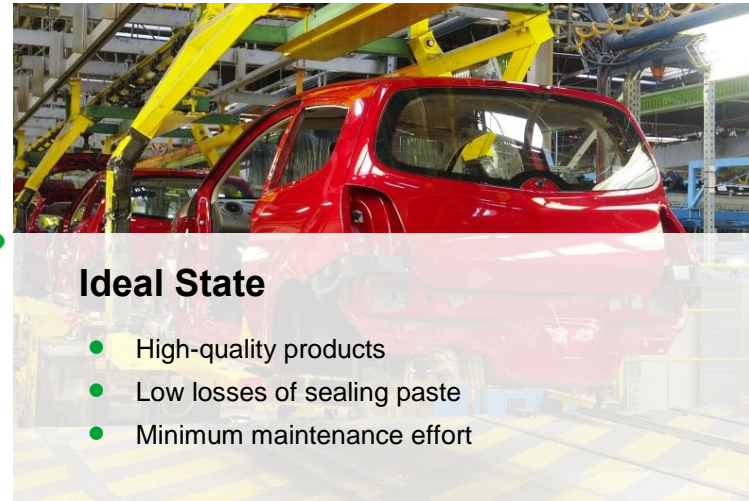
After the pre-determined degree of contamination has been reached, the filter material is cleaned by backwashing a small quantity of filtered medium. The backwash of the impurities is executed by the reject device within the filter. During the regeneration process, filtration continues.

Filtration is possible down to 3µm with fleece, to 5µm with fabric and microfiltration below 1µm with cake formation.

Applications OptiFil®

The Lenzing OptiFil® is used for fine and microfiltration of particles from low- and medium-viscosity media.

Case Study Sealing-Paste-Filtration



Solution Lenzing ScrapeFil

Sealing paste filtration process with scraper filter

Lenzing ScrapeFil

- Fully automatic system
- No pre-filtration necessary
- Simple construction, uncomplicated maintenance
- Low media losses due to high slurry concentration possible



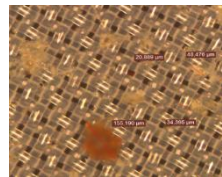
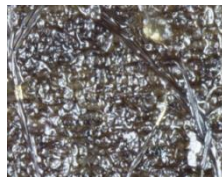
Case Study Sealing-Paste-Filtration

Sealing Paste Application

In the production process of car bodies, sealing pastes are sprayed onto the rabbets for sealing and corrosion protection reasons. To prevent spraying nozzles from clogging and get homogeneous sealing, the paste is filtered with a wedge wire filter type ScrapeFil and a filter fineness of 200µm.

Conventional Filtration

Originally, the sealing paste was not filtered, which on the one hand led to problems at the spray nozzles of the robot and on the other hand reduced the quality of the produced car bodies in the following process. Particles that dissolve during the cataphoretic pretreatment can reach undesired spots on the bodies, thus reducing the quality of the paint and leading to manual reworking.



Lenzing Filtration Filter System ScrapeFil



The Scraper filter Lenzing ScrapeFil is a fully automatic system that works according to the principle of surface filtration. The unfiltered media gets into the filter housing and is filtered from outside to inside of the filter candle.

Depending on the requirements, the filter candle can turn continuously or just when an adjustable differential pressure is reached, or via time. A fixed scraper plate is pre stressed to the candle surface and scrapes the impurities off. The removed particles settle down to the bottom of the housing and can be discharged by a time controlled automatic valve mounted on the bottom.

Applications ScrapeFil

The Lenzing ScrapeFil is used for fine filtration of low to high viscosity media with partial high solids concentrations.

Other potential applications

- **OptiFil® for phosphating bath:**

To maintain the bath quality also within the phosphating step, OptiFil® is used on the one hand to remove migrated impurities from previous stages and on the other hand within phosphating zone precipitated material. Especially the excellent particle separation as well as the easy clean-ability of the OptiFil® are beneficial for this process although it is now in a pilot stage.

- **OptiFil® for DI water production:**

For production of DI water, ion exchangers or reverse osmosis are used. These systems need fine pre-filtration, which can be done by OptiFil® in many cases. The OptiFil® has already been installed upstream in exchangers in different industries (see case study boiler feed water).

- **OptiFil® for process water from well or river:**

The OptiFil® is already also used as a central filtration for various process applications in different industrial sectors (case studies available on request).

- **OptiFil® for cataphoretic dip coating bath:**

To filter agglomerates of paint particles and impurities, it is very likely that an automatic backwash filter of type OptiFil® is suitable. A trial and testing period needs to be carried out for verification.

- **Disposable filters for cataphoretic dip coating bath:**

Silicone-free needle felt bag filters are used in the e-coat bath. The (nominal) filter fineness is around 10 – 25 micron.

- **OptiFil® and CanFil for cooling circuits:**

Backwash filters OptiFil® and CanFil are already installed in different industrial sectors in various open and closed cooling circuits. The purpose is to prevent nozzles and heat exchangers from clogging, and also to improve the heat transfer (Case Studies available).

- **Different cleaning and process baths:**

In the pretreatment of cataphoretic dip coating, there are several baths to treat the car bodies or parts, which require continuous filtration. Apart from the degreasing and cleaning bath after phosphating, (see previous pages). Disposable filters (mostly monofilament bag filters) are usually used in these baths.