Lenzing | Filtration

CakeFil™

Filtration's finest

Cake Filtration
Precoat Filtration

CakeFil™

Filtration’s finest

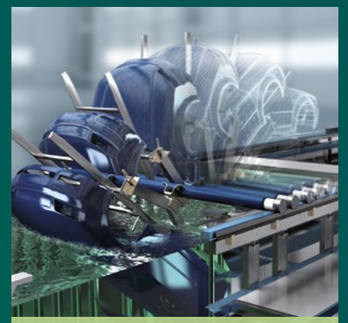
The process candle filter for cake building filtration with slurry or dry discharge. Its patented system enables a very efficient backwash and thereby a longer service life of the filter fabric.

This assures real process automation without interruption periods or any manual operation.

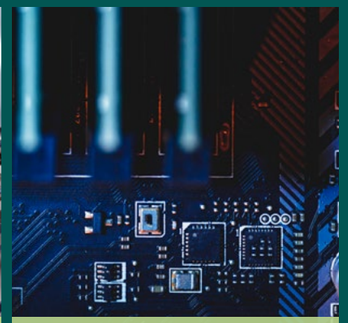
With its network of international sales partners Lenzing Filtration finds the best solution for your line of business, worldwide. No matter where you are, no distance is too far for us.

Our inventive talent combined with our sincere passion for our products, ensures the continuous enlargement of possible fields of application for our solid-liquid filtration systems.

Only this keeps innovation flowing...



Automotive industry



Electronics and photovoltaics

Oil and gas industry

Chemistry and pharma industry

Fiber industry and film production

Power plants

Steel and aluminum industry

Colors, resins and varnishes

Food and sugar industry

Pulp and paper industry

Electroplating and surface technology

Water treatment

CakeFil™

Candle filter for cake building or precoat filtration

The LENZING CakeFil filter is a fully automatic self-cleaning filtration system where pressure is the driving force to enable a filtration process, also known as tubular candle filter with cake building filtration.

In this sophisticated filtration technology, the solids present in the liquid stream, form a filter cake. This cake is built uniformly on the filter cloths covering the full length of the candle elements, so that the cake itself serves as filter media through which the liquid (filtrate) passes.

By this finest filtration (down to 1 micron) is enabled without the use of filter aid. In using filter aids, a filtration down to submicron range for precoat and/or bodyfeed filtration can be achieved.

At the end of the filtration cycle, solids may be discharged as dry-to-the-touch or alternatively in the form of a slurry. Optionally, an automatic cake-washing step (prior to the cake discharge step) is also possible.

The Lenzing Filtration patent pending candle design assures the forming of a consistent filter cake along the entire candle length, an efficient cake discharge as well as an extended service life of the filter cloth.

Advantages precoat filtration

- Filtration down to submicron range
- Suitable for solids tending to clog
- Dry or wet slurry discharge
- Suitable for corrosive fluids

Advantages cake filtration

- Filter fineness down to 1 µm without filter aid
- At certain conditions solid contents of up to 10% are possible
- Efficient cake discharge
- Unbeatable cloth service life

Application samples

- Petrochemical products
- Acids, lye, solvent
- Brine
- Agrochemicals
- Lubricoolants
- Sugar solutions
- Catalyst recovery

CakeFil™

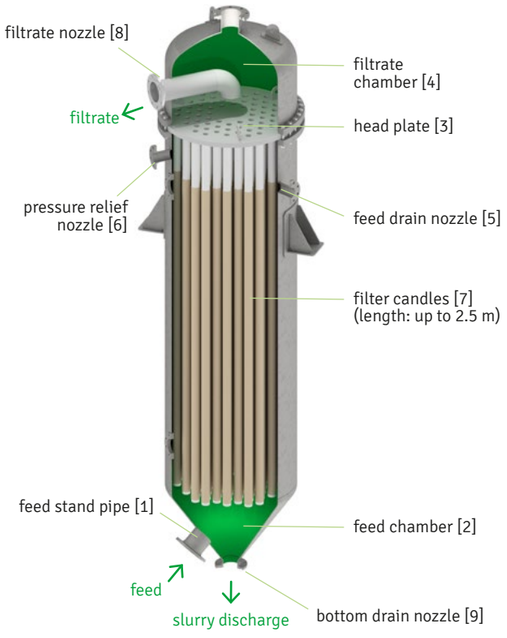
Slurry discharge

Filtration

Unfiltered fluid enters the filter via the feed stand pipe [1] and is distributed throughout the feed chamber [2]. It further passes the filter cloth and the filter candles [7] from outside to inside and exits the candles via the head plate [3] into the filtrate chamber [4] before leaving the filter through the filtrate nozzle [8]. Solids form a permeable “filter cake” on the cloth.

Backwash

The filtrate chamber is drained through the filtrate nozzle [8] and the upper part of the feed chamber is drained through the feed drain nozzle [5] to its level. The complete filter is pressurized with air or nitrogen. A sudden release of pressure through the pressure relief nozzle [6] forces a rapid reverse flow of filtrate through the filter cloth from inside to outside. This results in an effective removal of the filter cake, which is re-suspended in the fluid inside the feed chamber. It also removes solids from inside the pores of the filter cloth. The homogenous slurry is discharged through the bottom drain nozzle [9].



slurry

Dry discharge

Filtration

Unfiltered fluid enters the filter via the feed nozzle [1] and is distributed throughout the feed chamber [2]. It further passes the filter cloth and the filter candles [3] from outside to inside and exits the candles and the filter via the filtrate headers [4]. A permeable “filter cake” is formed on the cloth due to the solids.

Cake drying

After draining the feed chamber [2], air or process gas is applied in filtration direction to remove the majority of capillary fluid from the filter cake.

Optional cake washing

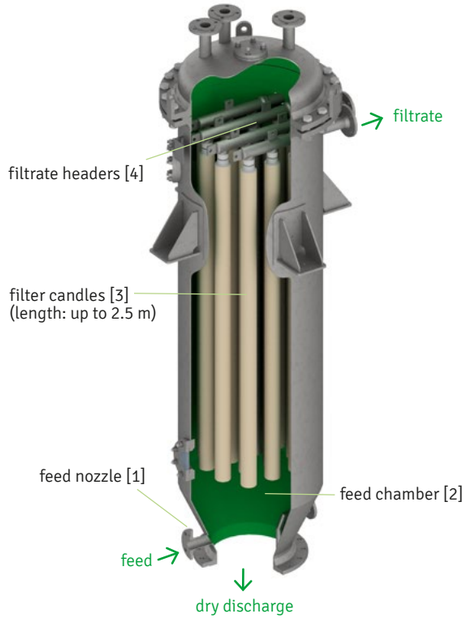
A washing fluid can be applied for cake washing followed by another cake drying step.

Cake discharge

Hereby, air is applied from the filtrate side that rapidly blows up the filter hose and thereby removes the filter cake, which falls down through the bottom valve in pieces typically “dry to the touch”. This is done for each filtrate header individually one after another (in large systems two by two).

Filter filling / Cloth cleaning

The filter is filled via the feed nozzle [1]. Before the filtration starts, air or gas is introduced via the filtrate nozzle to force fluid to pass through the cloth in the opposite direction of the fluid flow. This effectively releases trapped particles in the pores of the filter cloth.



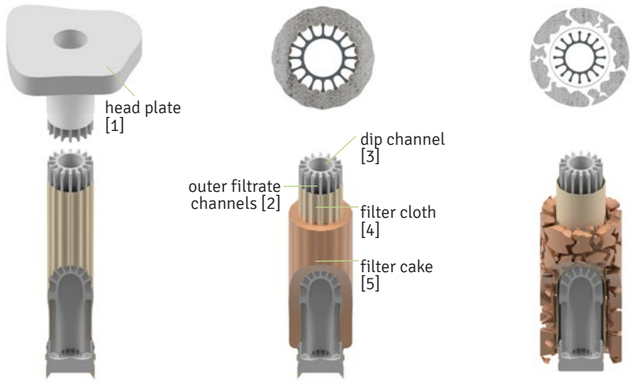
filter cake

CakeFil™

FILTER CANDLE DESIGN

The filter candle is equipped with outer flow channels (filtrate channels) [2] for the filtrate, which are connected at the bottom end of the candle to a central dip channel [3]. During filtration, the filtrate flows downwards via the outer flow channels and leaves the candle upwards via the central dip channel. This allows for a complete emptying of the candle from liquid when flowed through by pressurized air.
During backwash, the flow direction is reversed and air or gas is being brought to the very bottom of the candle. An essential factor for an efficient, differential pressure driven backwash.

start → filtration → backwash



THE CAKEFIL EFFECT

Continuous. Maintenance-free. Long-lasting.

The patent pending design of LENZING´s CakeFil filter candle leads so far to an unmatched efficiency in removing particles from the pores of the filter cloth.

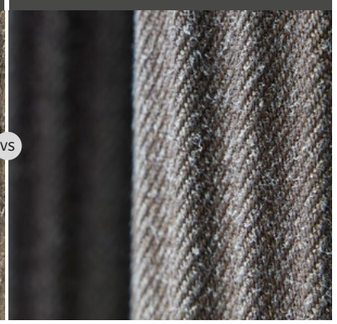
Proof under laboratory conditions

Remaining solids in pores after 85 backwashes:

Standard filter candle	LENZING CakeFil design
	
96 g/m²	22 g/m²

A test with different filter candles and solids with a fine size distribution has shown that the remaining (non backwashable) particle weight in the pores of the cloth can be reduced by 80% compared to prior state-of-the-art filter candles.

Proof under process conditions

Standard filter candle	LENZING CakeFil design
	
Filter cloth of a standard filter after 10 days lifetime (= change interval)	LENZING CakeFil filter cloth after the entire production campaign

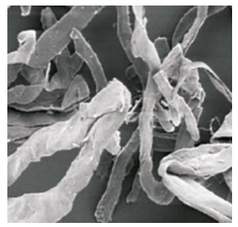
A long-term test performed by a beet sugar factory illustrates the CakeFil effect during the filtration of mud juice.
During the entire length of a production campaign, no filter cloth change was necessary at a CakeFil operated in parallel to existing tubular candle filters.
At the same time, the filter cloths of these installed standard filters had to be changed seven times.

CakeFil™

FILTER AIDS

For soft and slimy solids or if adsorption of components in the fluid is needed, various kinds of filter aids can be applied as precoat and/or dosed to the fluid as a so called “body feed”.

Cellulose

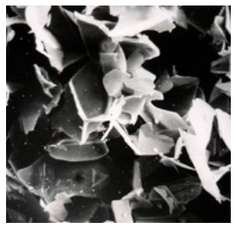


Available as natural wood fibers, extract free fibers and highly pure fibers for food and pharma applications

Diatomite

Agglomerated fossilized residues of diatoms

Perlite



Volcanic material used in chemical and food industry

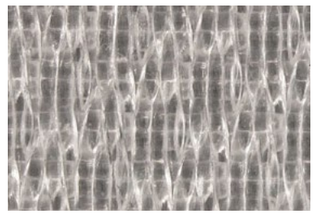
Activated carbon

For removal of hydro-carbons, chlorine or other unwanted dissolved components by adsorption

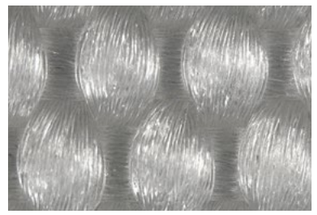
FILTER CLOTH

Various filter materials are available for each individual application, with pore sizes down to 1 micron for temperatures up to 180°C.

PP
Mono | Monofilament

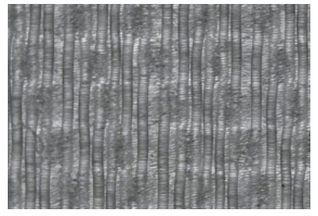


PP
Multi | Multifilament



PVDF | PTFE
Mono | Monofilament

PP
Mono | Multifilament



PPS
Multi | Multifilament

PVDF
Mono | Multifilament

CakeFil™

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.

Laboratory pressure filter

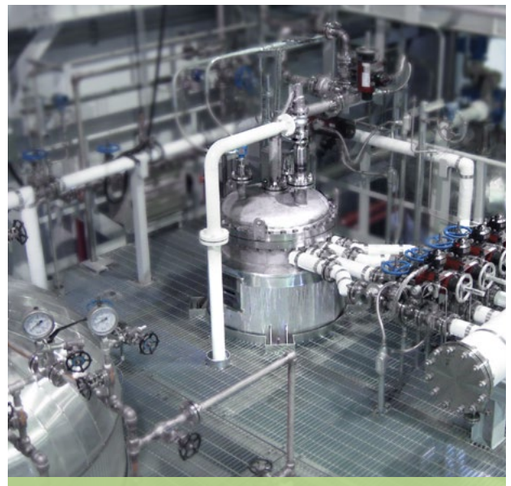
CakeFil pilot plant

Cake thickness measurement

Filling of laboratory pressure filter

INSTALLATION EXAMPLES

Finest filtration coupled with highest backwash efficiency
assures satisfied customers, worldwide.



CakeFil in chemical industry | location: Korea

CakeFil for optical films | location: Central Europe

CakeFil for specialty paper application | location: Germany

CakeFil™

Filtration's finest

For an individual offer,
please contact:

filter-tech@lenzing.com
+43 (0)7672 701-3479

Lenzing | Filtration

Lenzing AG – Division Lenzing Filtration
4860 Lenzing, Austria
www.lenzing-filtration.com