

GORE® Tubular Back-Pulse Filters
For Lithium Applications

EFFICIENT METAL HYDROXIDES FILTRATION AT HIGH FLOW RATES

Together, improving life



Cost effective separation of fine solids including metal hydroxides

A thickener & polisher combination that reduces capital and operating expenses

For over 40 years, GORE® Tubular Back-Pulse Filtration has been significantly reducing costs by handling variations in feed solids and flow rates without the need for precoat, body aid, and/or flocculants. This is possible because of the unique microporous structure of the GORE membranes and the overall geometry and operation of the filter. The GORE® Filter system offers a highly efficient and cost effective means of separating fine solids from high industrial flow rates. It is capable of economically filtering slurries as dilute as several ppm to over 10% by weight solids, and flow rates of 100 gpm to over 2000 gpm.



GORE® Membrane filter sock

These filter socks are available in both PP and ePTFE felt backed laminates and are used to purify the brine regardless of source in the Lithium production process. Purifying various process/ wastewater streams including over 100 Chlor-alkali installations worldwide, we have proven the success of our precoat-free technology in replacing a traditional three step filtration system (clarifier, sand filter, precoat filter) with a one-step filter.



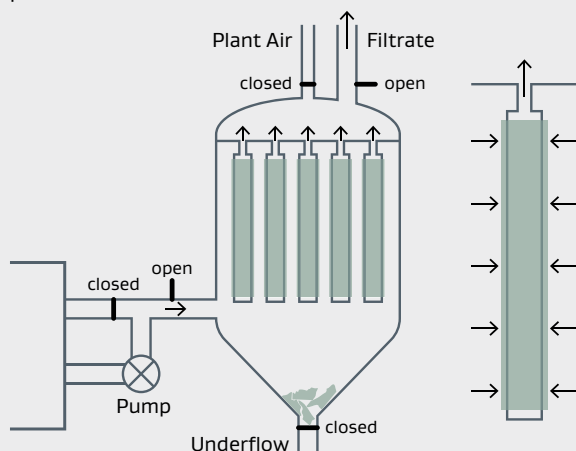
GORE® Filter Tube assemblies

GORE® Filter Tube Assemblies have 2.5 times the filtration area of the GORE® Filter Socks in a given volume. This leads to smaller and more economical filter vessels. They consist of a filter media and support element in one. It is a simple "drop in place" making installation very easy.



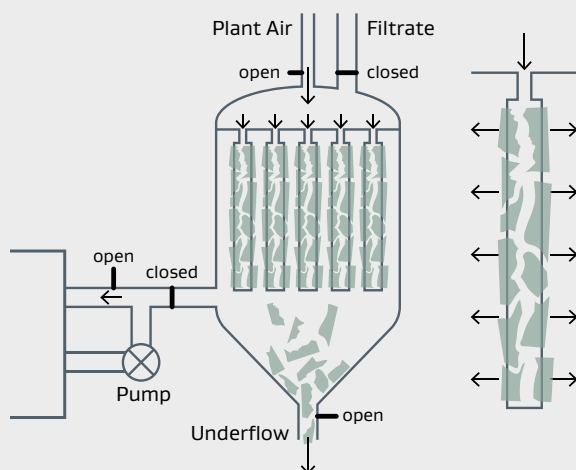
Filter Mode

The slurry is pumped into the filter and the fine feed solids are captured immediately on the surface of the GORE® Filter Socks. The fine solids are consolidated under pressure during filtration into a cake. The filter cycle continues for a predetermined amount of time or volume, at which time a back-pulse cleaning step takes place.



Back-Pulse Mode

The back-pulse step is rapid flowing of a very small fraction of the filtrate back through the membrane at very low pressure. The filter cake comes completely off the membrane surface and does not redisperse but rather stays agglomerated and settles rapidly to the bottom of the filter vessel. After a short settling time, the filter cycle starts again. The underflow from the filter is discharged on a batch or continuous basis as a high density slurry.



Design and operation

A tubular back-pulse filter operates like a “liquid baghouse.” Operating at low differential pressures with short filter cycles yields thin cakes, thereby maximizing the flux rate through the filter. Since cake removal is achieved by a flow reversal (pulsing) of only 3–5 seconds, filter cycle time can be as short as 2–3 minutes and for all practical purposes the operation is continuous. The filter vessel is not completely drained of liquid during or after pulsing. The filter operates as both a thickener and polishing filter in one.



GORE® Membrane filter socks

The filter elements of the tubular back-pulse filters are outfitted with GORE® Membrane Filter Socks. It is the GORE Membrane that makes back-pulse filtration possible, because it gives immediate clarity, high flow rates and complete cake release with minimum back-pulse pressures. The filter socks consist of a GORE Membrane laminated to a variety of different felts depending on the application. The all ePTFE laminate is inert to practically all chemicals and can be used at temperatures up to 500F. The laminate products combine the filtration efficiency of membranes with the durability of needled felts. The porosity and particle retention of the membrane can be controlled to fit specific filtration applications. The filter socks are constructed with either welded seams or sewn seams that are seam taped to make them leak-proof.

Applications

GORE® Tubular Back-Pulse filtration technology has been successfully used in numerous applications across a wide range of industries. The technology has been effective both as a concentrator and polish filter for both process and wastewater streams. Applications could include:

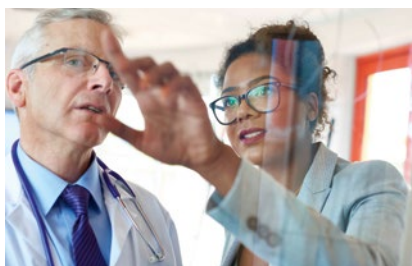
- Replaces clarifier/sand filter/polish filter combo
- Precoat elimination
- Preconcentrator prior to dewatering filter
- Product recovery
- Pre-purifier upstream of IX, DLE, RO or electrolysis

Features

- Versatility
- Thin cake/high rates
- Low filtration & backpulse pressures
- Immediate cake formation
- Short cake removal time
- Dense, high solids underflow
- Fully automated

Benefits

- Effective filtration of sticky metal hydroxides
- Membrane quality separation at high industrial flow rates
- High solids loading separation capability
- Low capital costs
- Low operating costs
- Thickener & polish filter combination
- Small (footprint)



A materials science company
dedicated to transforming industries
and improving lives

About Gore

W. L. Gore & Associates is a global materials science company dedicated to transforming industries and improving lives. Since 1958, Gore has solved complex technical challenges in demanding environments — from outer space to the world's highest peaks to the inner workings of the human body. With more than 13,000 Associates and a strong, team-oriented culture, Gore generates annual revenues of \$4.8 billion.

Learn more at [gore.com/filtration](https://www.gore.com/filtration)

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