

Why filter liquids

The reasons for liquid filtration are many and varied.

Product quality/standardisation

To ensure that a finished or delivered product is free from all possible contaminants and provide a consistently clean supply.

Pollution control

To remove potentially hazardous solids or liquids from a waste stream prior to discharge back into the environment.

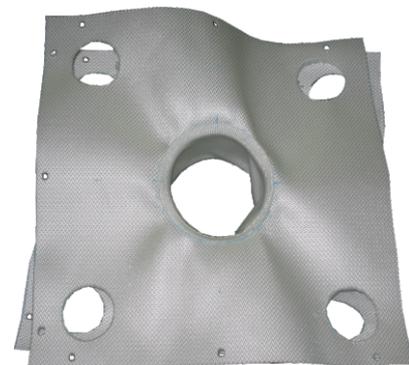
Equipment protection

To aid in prolonging of equipment life such as pumps, engines, hydraulic equipment, heating and cooling coils.

Recycling

Process water in food manufacturing plants, vehicle wash bays, separation of solids from chemicals for re-use.

Filterfit supplies a range of both industry standard and non standard liquid filter solutions across a large industry sector. Some but not all products are shown within this manual. Should the item you are seeking not be shown here, please contact our office for assistance from one of our technical sales staff.



Rotary vacuum disc filters

A rotary vacuum disc filter is designed to separate liquids from solids for de-watering purpose. The primary industries where disc filters are used are pulp and paper and mining.

Process and operation

Using a continuous filtration process, disc filters have one huge advantage over other filter designs in that they offer a much larger filter area per unit of floor area.



This smaller footprint makes disc filters particularly suited for the processing of bulk products on filter floors as found in alumina refineries, coal preparation plants, pulp and paper processing and so on.

The basic principal construction of a disc filter is that a number of filter discs are mounted parallel to one another on a horizontal shaft. Each disc is made up of interchangeable sectors covered by an individual filter cloth. Individual sectors can be removed independently so that filter cloths can be replaced as required.

During operation, the shaft rotates which in turn, rotates the discs through a sump into which a slurry is fed. A vacuum is applied to the disc sectors via pipes running through the core of the shaft, along which the filtrate is also removed. Cake collects on the submerged part of each sector, and is removed from the slurry suspension as the disc rotates. The final part of the cycle removes the cake into a collection trough by both scraper blade and snap blow before the cycle is repeated.

Disc sector filter cloths

Filterfit disc filter cloths are designed to give long life, great cake release and low cake moisture content. Both woven and non-woven (needlefelt) fabrics are available in a range of synthetic fibres to withstand aggressive chemicals, high temperatures and abrasive slurries.

Of course, they can be custom manufactured to fit any disc sector encountered in the market place. Zip or Velcro enclosures can also be added upon request.



Rotary vacuum drum filters

Rotary vacuum drum filters (RVDF) are one of the oldest filters used for industrial liquid / solids separation.

As a basic separation process, drum filters are used in a wide range of industries and applications.

Dewatering slurries of pulp, food products, mining products, waste water and even wine are very common uses for drum filters.

The primary advantage of drum filters is that they utilise a continuous filtration process rather than a batch filtration process, as seen with filter presses. They are also comparatively simple with few moving parts and are automatic in operation, so costs are low.

The primary disadvantage of drum filters is that the cake produced is of a comparatively high moisture content, however this is not often an issue, especially if further downstream treatment of the cake is necessary.

A rotary vacuum drum filter consists of a large rotating drum covered by a filter cloth. The drum is suspended on a shaft over a trough containing a slurry. Approximately 50% of the drum screen area is immersed in the slurry.

As the drum rotates into the trough, slurry is sucked onto the surface of the filter cloth forming a cake due to the drum being under constant vacuum. Filtrate is removed from the inside of the drum continuously and usually re-circulated into the system (unless it is collected, such as in wine-making).

As cake is picked up and rotated out of the trough, it will be continuously dried until reaching the cake take off point. The cake will then be removed automatically by a scraper blade or similar process for collection. As well as scraper blade discharge, other methods are sometimes used: belt discharge, roller discharge and string discharge.

As mentioned, drum filters utilise continuous filtration, whereby solids are separated from liquids through a filter medium / cloth using vacuum. The filter cloth itself is one of the most important components of the filter and is typically made from woven synthetic fabrics. The choice of filter cloth type has a direct influence on the overall performance of the filter.

Filterfit supplies precision woven drum filter cloths and covers (roll, scraper, string and belt) are available to fit any size drum filter and any configuration.

Our drum filter fabrics are available in all common and uncommon polymers in use today. Drum filter fabrics provide great cake formation, filtrate drainage and cake release. Their long cloth life ensures less maintenance downtime and costs.



Horizontal vacuum belt filters and belt filters

Belt filters are used in a wide range of industries for solid / liquid separation processes. They are particularly common in mining, chemical plants and for waste water treatment.

One main advantage of belt presses over other filtration processes such as filter presses, is that they utilise a continuous filtration process, rather than a batch filtration process as seen with filter presses for example. This equates to high product throughput.

The filtration process is achieved by either squeezing a sludge between two filter belts under pressure as with a belt filter, or by the use of vacuum underneath one single belt as with a horizontal vacuum belt filter. Of course the selection of the correct filter belt or filter cloth is critical for the optimum operating efficiency of the filter/process.

In short, belt filters take a slurry or sludge as a feed and separate the liquid or filtrate, and the particles into a solid cake.

Filter belt/cloths

Filterfit is able to supply filter belts/cloths for all brands of belt filters, and in a range of filter fabric polymers and weave styles. Either woven or spiral belts are readily available, with a variety of seam types available to industry – clipper, endless spliced, pin and sewn seams.

Filterfit supplied filter belts offer:

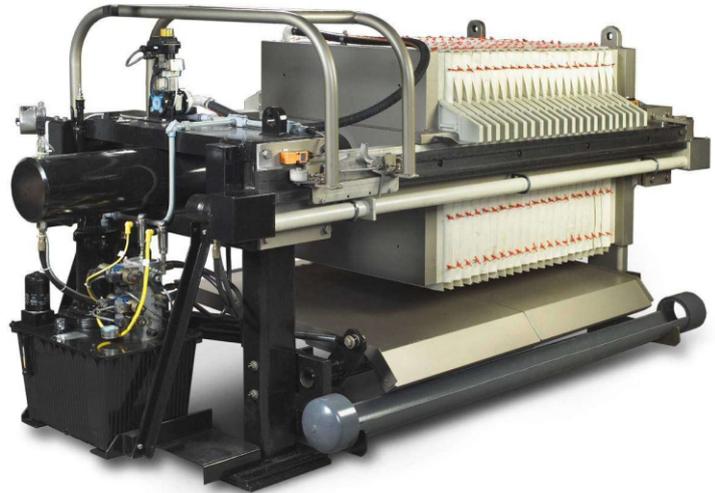
- Excellent particle / solid capture.
- Excellent cake release.
- Dimensional stability
- A variety of seam types.
- A variety of lengths and widths to choose from.
- Durability and long life.



Filter presses

Filter presses have been used in industry for more than 100 years. They are still by far the most efficient filtration equipment utilised to de-water a slurry down to less than 10% moisture content. They are very common in pharmaceutical, waste water, food and mining applications.

The moisture content of the cake produced by a filter press is usually the most important criteria of the whole operation.



Process / operation

Filter presses utilise a solid particle/liquid separation process using pressure. This pressure is applied via a ram to squeeze a number of plates together and a slurry pump which provides the slurry to be de-watered. The method of filtration is what is termed *fixed volume and batch operation*, rather than a continuous operation. Simply put, it means that the filtration process must be stopped to discharge the filter cake before the next batch can be started.

The major components of any filter press are the skeleton and filter pack, which is made up of any number of individual plates. These plates are covered by a filter cloth. The skeleton holds the filter pack together whilst pressure is being generated inside the filter press plate chambers by slurry. Each chamber can only hold a specific volume of slurry.

The process starts by the closing of the filter plates by the hydraulic ram. Then the injection of the slurry into the press to fill up each chamber. The filling time should be as short as possible so as to avoid cake formation in the first chamber before filling up the last chamber.

Whilst the chambers are being filled, the pressure inside the system will increase due to the formation of thick sludge. Then the filtrate (liquid) will be forced and filtered out through the filter cloths and into a collection tray.

More efficient filtering can be achieved in more modern membrane style filter plates by the injection of air, which gives the formed cake a final squeeze before opening the press. Once full pressure is reached, the hydraulic ram will open the press, and the formed filter cakes will drop into a trough underneath the filter press for collection.

There are three main types of filter press styles:

- Plate and frame
- Recessed plate and frame
- Automatic membrane

Filter press clothes and plates

Filterfit supplies a full range of filter press cloths for industry: barrelneck, caulked and drape-over style to fit all major brands of filter presses. We also make a range of synthetic filter fabrics in needled and woven fabrics to suit different applications.

The most common synthetics are Polyester, Polypropylene and Nylon. But other more specialised materials are available upon request.

Key features for filter cloth fabric selection are:

- Strength = good cloth life
- Filtration efficiency
- Cake release
- Filtrate clarity

With correct filter cloth selection, all these desired filter cloth characteristics can be realised.

Filterfit can also supply filter press plates for all filter press configurations.

Also available from Filterfit upon request

- Centrifuge liner covers
- Municipal pool candle and plate filter clothes
- Rotary pan filter clothes
- Anode/electroplating bags

A range of non-standard fabricated items suitable for use with:

- Aquaculture
- Brewing and beverage manufacture
- Dairy production
- Irrigation
- Chemical/petrochemical processing
- Edible oil processing
- Pharmaceutical
- Paint and pigment
- Fertilisers
- Pulp and paper
- Minerals and metals

