

## Filtration Solutions



# OUR COMPANY

## CPE FILTRATION TECHNOLOGY APPLICATIONS

- Mineral Processing
- Chemical
- Environmental
- Industrial Processes
- Pulp and Paper
- Pharmaceutical
- Food and Beverage
- Fertiliser and Agrochemicals



Chemical Plant & Engineering is an Australian owned company specialising in design, manufacture and supply of Agitators, Filters, and Powder Blenders for a variety of applications.

CPE offers a complete engineering service, from laboratory and pilot plant testing through to detailed engineering design, manufacturing, installation and commissioning. This ensures that the process outcomes meet our customers' objectives. We analyse process conditions and recommend the most suitable and economical solution.

Our extensive installation lists and references testify to our experience and capabilities to undertake large and small projects. Our policy of continuous design and development through in-house engineering as well as our international licensing arrangements have enabled us to introduce world leading processing technologies to various industries globally.

We can provide you with quality custom processing solutions for reliable and efficient operation and lower operating costs.

## FILTRATION

Filtration is the separation of one medium from another, generally a solid separated from a liquid. Common elements required to achieve this process include:

1.A driving force (pressure difference) which can be created by either pressure or vacuum.

2.A filtration medium which is selected on a case by case basis of suitable materials of construction, open area (to allow liquid to pass, but not the solid) and strength to support the accumulated solid particles.

This only represents the very basic concepts and there are many more factors that affect the final choice of filter.

The key variable in determining the filtration area is the filtration rate. This is a measure of the rate at which the solids will separate from the liquids and is expressed as:  $m^3/m^2/hr$  or  $kg/m^2/hr$

This determines the area required to process the feed and the subsequent selection is made based upon cake (solids) behavior and process objective.

## FILTRATION EQUIPMENT

Chemical Plant & Engineering designs and supplies a variety of Vacuum Filters and Pressure Filters. Specific product characteristics and process requirements will determine the most effective filtration solution. 

### Pressure Filters

- |  |   |
|--|---|
| Pressure Leaf -<br>Wet or Dry Cake Discharge | ➤ Vertical  |
|  | ➤ Horizontal                                      |
| Pulse Tube -<br>Wet or Dry Cake Discharge    | ➤ Cricket® Filters                                |
| Filter Press -                               | ➤ Side Bar<br>Recessed Chamber<br>Membrane Press  |
|  | ➤ Over head<br>Recessed Chamber<br>Membrane Press |

Bag Filter

### Vacuum Filters

- |  |                            |
|--|----------------------------|
| Rotary Drum -<br>Discharge types include | ➤ Blow Back Scraper        |
|  | ➤ Roller                   |
|  | ➤ String                   |
|  | ➤ Belt                     |
|  | ➤ Knife Advance - Pre Coat |

Horizontal Rotary Pan



# VACUUM FILTERS

Chemical Plant & Engineering has a long history of vacuum filter supply. A primary advantage of vacuum filtration is the savings in time and labour through its continuous reliable operation. Depending on the composition of the slurry and the working environment, vacuum filters can process slurries for long periods without operator attention.

## DETERMINING FILTER SIZE

Vacuum filters are available in a variety of sizes and are rated in square meters of effective filtration area. Determining exactly how big (area) a filter is required for your process depends upon a number of factors, all of which are interrelated:

- Filtration Rate
- Cake loading rate
- Desired clarity of filtrate (Allowable solids in Filtrate)
- Nature of solids – residual moisture requirement
- Washing requirement - residual mother liquor allowable

## VACUUM FILTER TYPES

The behaviour of any given slurry under vacuum is entirely predictable – every square meter of filter area will filter at a given rate.

Once the laboratory tests have been completed, recommendations can be made as to the size and type of filter required.

## ROTARY DRUM VACUUM FILTERS

Drum Vacuum Filters consist essentially of a cloth covered drum rotating in a tank filled with the slurry to be filtered.

The surface of the drum is divided into shallow compartments and these are connected by internal pipelines to an automatic valve so that the vacuum can be applied.

As the drum rotates, each compartment goes through the same cycle of the operation – Filtering, de-watering and discharge of the cake.

Rotary Drum filters are available in five different cake discharge systems:

- Blow Back Scraper
- Roller
- String
- Belt
- Knife Advance – Pre Coat





## HORIZONTAL ROTARY PAN VACUUM FILTERS

Horizontal Rotary Pan Vacuum Filters are divided into wedge shaped segments covered with a filter media appropriate to the slurry.

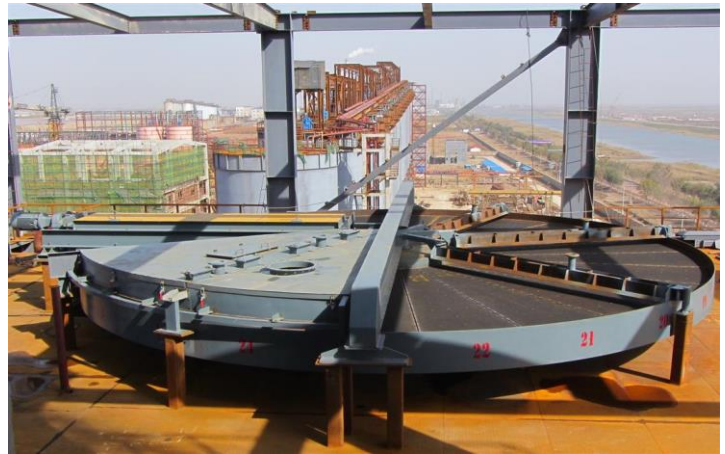
The feed slurry enters the top mounted feed box which distributes the slurry on to the pan and the mother liquor is removed under the combined forces of gravity and vacuum.

Pan filters are suitable for continuous filtration of rapid settling, free filtering solids and are designed for ease of installation and simple reliable operation.

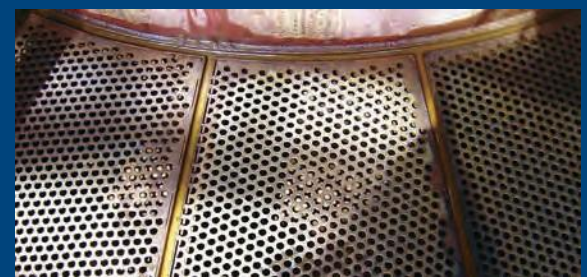
Pan filters provide rapid dewatering and efficient cake washing at large capacities.

### Features include:

- High throughput per square meter of filtering area.
- All filtration and wash stages are visible for ease of control.
- Multiple wash stages including counter current washing.
- Superior Pan flatness enabling operation to ensure minimum cake heel.



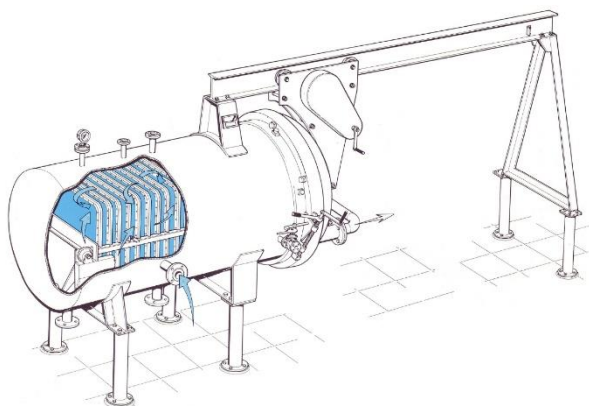
100 m<sup>2</sup> rotary pan vacuum filter manufactured by CPE



# PRESSURE LEAF FILTERS

The Chemplant Pressure Leaf Filter is used for polishing process streams containing low percentage w/w solids typically < 5 % w/w. The filter consists of a vertical or horizontal pressure vessel with a number of vertically mounted filter leaves. The filter leaves filter on both sides enabling a large filtration area in a relatively small vessel and plant footprint.

The standard working pressure of a leaf filter is 4.5 Barg and cake can be discharged wet or dry.



## HORIZONTAL FILTER

The filter leaves are built onto a carrier, which can easily be removed from the filter for manual cleaning.

The filters can be equipped with swing bolt or clamp ring closure to open the filter and remove the carrier.

The filter is available in retractable bundle or shell versions.

Wet and dry cake discharge options are available.



## CRICKET & PULSE TUBE FILTERS

Tubular or Cricket® Filters (named due to element shape resembling a cricket bat) operate in a vertical pressure vessel with filter medium covering internal filtrate flow pipes.

### Characteristics

- Large Filtrate area in a small vessel volume and small plant footprint
- High throughput of liquid (up to 10m<sup>3</sup>/h/m<sup>2</sup>)
- Fast cake discharge and backwashing or back-pulsing enabling higher equipment utilisations.

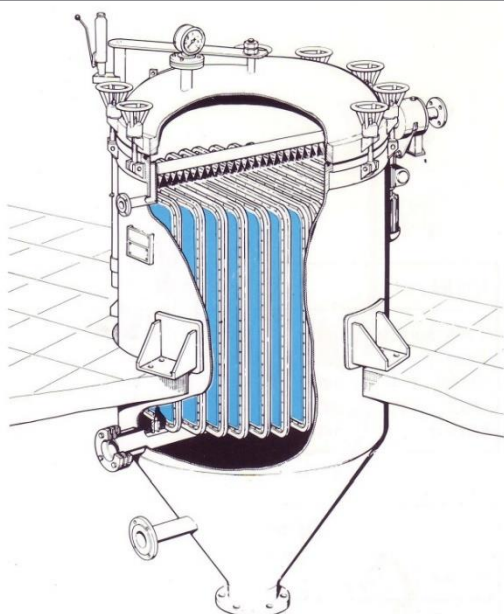
## VERTICAL PRESSURE LEAF

### Dry Cake Discharge

For dry cake discharge this filter is equipped with a pneumatic vibrator.

The cake is discharged through a large diameter cake clean-out door. Depending on the process conditions a butterfly valve, a slide valve or a specially designed cake door is used for cake removal.

For wet cake discharge the filter is equipped with an oscillating sluice pipe positioned above the filter leaves.



# FILTER PRESSES

## SIDE BAR FILTER PRESS

All models in this category come in a standard filtration pressure range of 6 to 16 bar and are available as manual, semi-automatic or fully automatic and programmable options.

There are three basic operating stages in the filtration cycle:

- Closing
- Filtration
- Opening for cake discharge

\* Additional steps such as membrane squeezing and cake washing can be included.

In the manual Filter Press option, all basic operating stages are manual. The semi automatic models have an automatic squeezing operation, and all three stages are automatic in the automatic filter press.

## HIGH YIELD FILTER PRESSES

The PFO filter press was developed for heavy duty arduous industries where reliable operation is required to guarantee high industrial production capacities.

The PFO filter is available in side and overhead arrangements and includes:

- Fast opening process in order to achieve the maximum number of cycles.
- Rapid filter cloth washing
- Sealed recessed and membrane plates with large adjustment capacities
- Utilization of four side pulling cylinders to ensure plate alignment is maintained







## CHEMICAL PLANT & ENGINEERING

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