PrepQuip

WORLD LEADER IN SPECIALISED MINERAL PROCESSING EQUIPMENT

# TECHNICAS HIDRAULICAS FILTER PRESS

## 1. INTRODUCTION

The **Tecnicas Hidraulicas Fully Automatic Filter Press** (manufactured in Spain since 1990), offers a cost effective and robust solution for the demanding operating conditions found in the mining and mineral industry. With the growing demand for the elimination of slimes dams, this product will find its right-full place in this competitive market due to its low capital and operating costs. The design ensures durability, reliability and effectiveness with unique advantages. The Filter Press size ranges from **1.4m² to 208m², which are capable of producing filter cakes of up to 85 tons/hour dry solids.**

## 2. FEATURES AND BENEFITS

The successful performance of the TH filter technology in the mining industry has resulted in the installation of more than 154 units globally. The major reasons for its success are:

a) **Improved filter equipment**. Tecnicas Hidraulicas (Spain) is doing ongoing research and development to improve the performance of the TH press. Recent TH filters delivered are equipped with the latest technology and improvements.

b) **Simplicity of the fully automatic operation**. No skilled operator is required to operate the machine, thus no "babysitting".

c) **Robustness**. Filter plates are made from 40mm thick steel plates. The filter plates are thus virtually indestructible even under adverse conditions.

d) **Moving parts**. It is known in the filter press industry that moving parts on a unit requires maintenance and replacement of spares. There are only a few moving parts on the TH press. The overall parts consumption and maintenance are therefore limited to the minimum.

e) **Positive cake discharge**. The filter plates are not fixed to the frame of the filter. The plates are linked with chains on the top and travel on rail girders during opening/closing. During cake discharge, six (6) plates are opened at a time, which allows for a large opening between the chambers. There is also a swinging movement of the plates that ensures positive cake discharge. Therefore, no complex cake discharge system is required.

f) **Cloth washing**. The TH press has a cloth back-washing step available as an option. The TH press uses mono-filament cloths, which has a large open area. In the beginning of filling and filtration steps, solids start to form on the cloth. The first 10 seconds of filtrate is normally dirty, where after it becomes clear since the already formed cake on the cloth acts now as a second filter medium. During air drying, air is blown in the opposite direction as the filtrate flow during filtration. This step pushes solids on the cloth surface back into the chamber. In many applications we have found that no cloth washing is required. However, if multi-filament cloths were used, cloth washing needed to be applied to avoid blinding of the surface. Fines that get entrapped in the fibres of the cloth normally cause blinding.

g) **Diaphragm pressing**. The TH press does not use rubber diaphragms to achieve cake pressing. Diaphragms are known to be expensive and do not last for long periods. Cake pressing on the TH filter is achieved by pressing the 27mm rubber inserts (seals) between the steel plates, using the main hydraulic closing cylinders. The rubber inserts (seals) last on average 2 years.

h) **Feed pumps**. The TH press is equipped with its own hydraulic pumps, which operates from the filter hydraulic power pack. The pumps have low installed power and energy and spare parts consumption are significantly low.

## 3. OTHER DESIGH FEATURES

- Each chamber is fed individually which ensures all cakes are uniform in size distribution and moisture content. This also results in a less complex and costly filter cloth design.

- Each Filter plate has a separate visible filtrate discharge pipe. The main advantage is that only the damaged cloth can be identified and replaced which reduces downtime and maintenance costs.

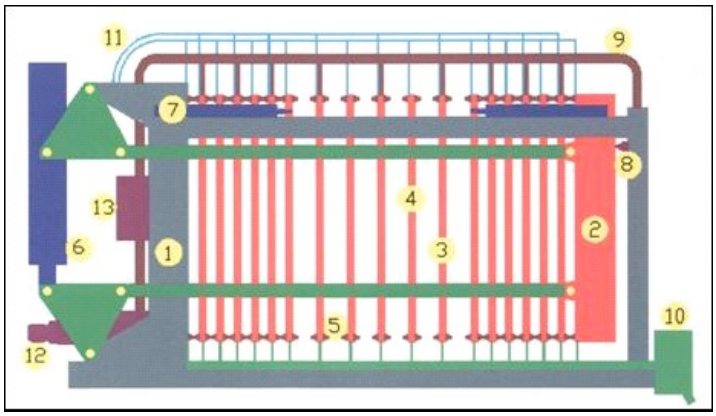
- The supply is complete with a filtrate flow measurement system to ensure consistent and automated filter press operation.

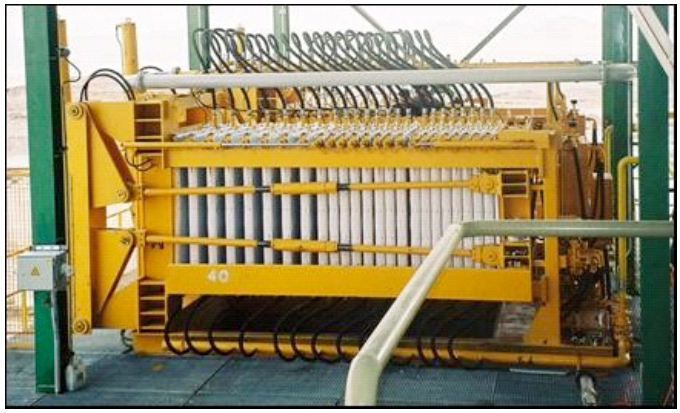
- The use of only a few chambers has the following advantages:

  ⇒ Less downtime to replace worn or torn filter cloths.
  ⇒ Less movable parts and complexity.
  ⇒ Significantly lower filter cloth costs.
  ⇒ Discharge of filter cake significantly faster (approximately 30 seconds), and thus shorter cycle times.

- The Filter Press comes complete with all valves, instrumentation PLC programming and electrical control box to SIMPLIFY INSTALLATION and commissioning requirements.

## 4. COMPONENTS OF TH FILTER PRESS



1. Filter frame
2. Pressure plate
3. Filter feed plate
4. Filter blind plate
5. Filtrate ports
6. Closing/opening cylinder
7. Plate shifting cylinder
8. Limit switch
9. Feed distribution pipe
10. Filtrate/effluent collecting box
11. Air for filtrate blow (before cake discharge)
12. Hydraulic pump

## 5. OPERATING PRINCIPLE OF TH FILTER PRESS

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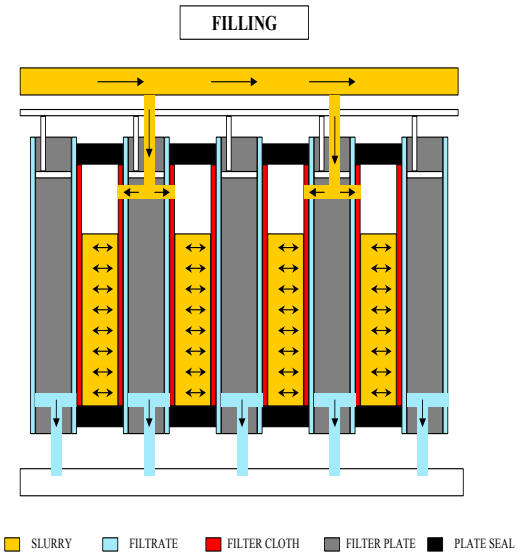
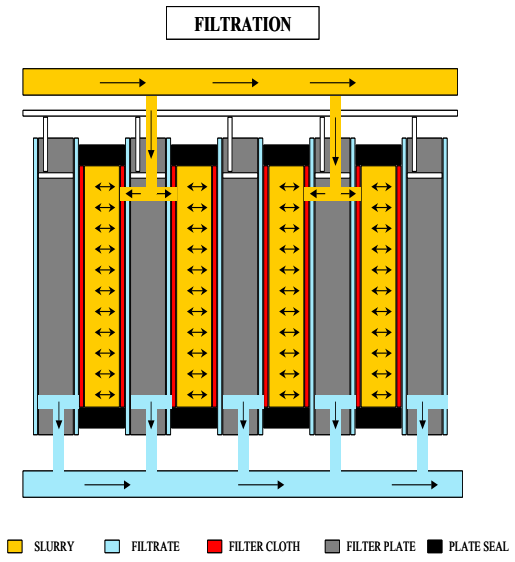
| **Slurry fill.** Each vertical chamber is fed individually (from the top), which ensures all cakes are uniform in size distribution and moisture content (using the forces of gravity to its benefit) |  |
| **Filtration.** Once the chambers are filled, pumping continues to ensure the maximum solids are introduced. Filtrate drains from every chamber and is collected in a common drain tank. A probe is installed in the filtrate tank to measure the volume. If the filtrate stops, a signal is send to the PLC program and the feed pump is automatically stopped and the cycle continues to the next step. |  |

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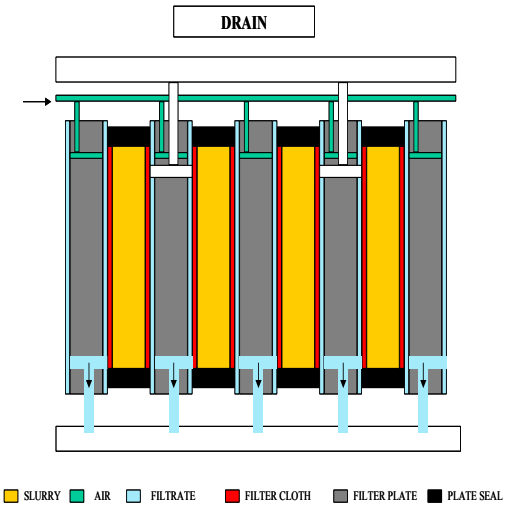
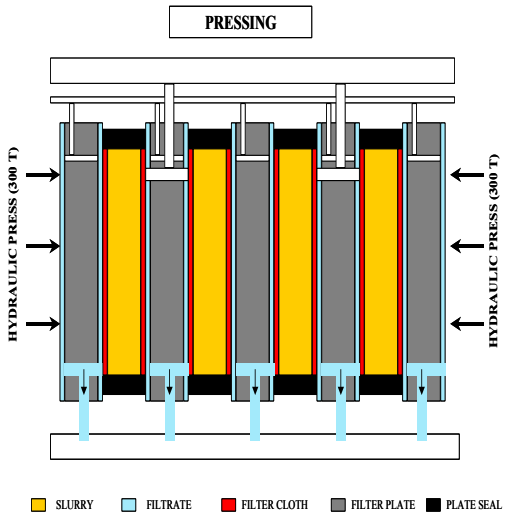
| **Drain.** Air is introduced in the feed manifold to ensure that slurry is forced into every individual chamber. |  |
| **Cake Pressing.** Hydraulic pressing is used to homogenise the cake. This is achieved by compressing the rubber seals between each chamber, using the hydraulic closing cylinders (340 Tons). |  |

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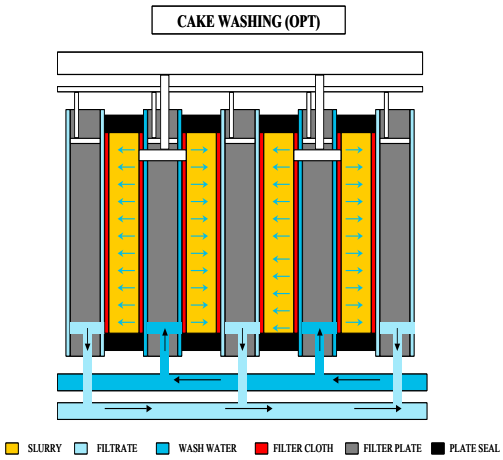
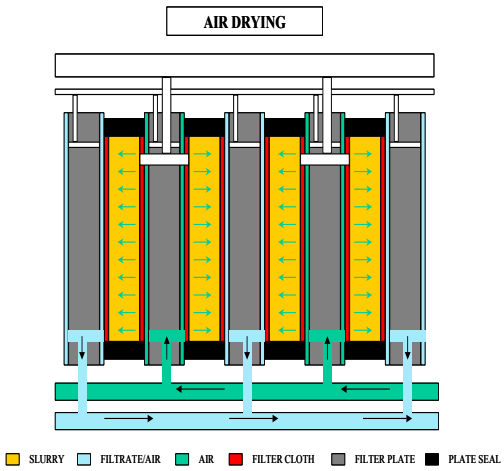
| **Cake washing (optional).** The cakes can be washed to displace the mother liquor. Water penetrates the cakes via the filtrate ports. A minimum amount of wash liquid is required for this step and normally does not exceed 2 m³/ton dry solids. |  |
| **Air drying.** Air penetrates the cakes via the filtrate ports, to ensure even cake moistures throughout the cakes. |  |

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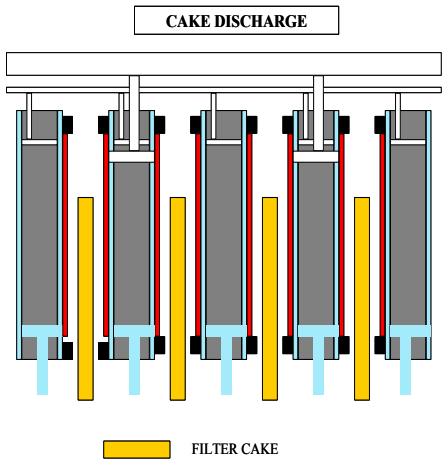
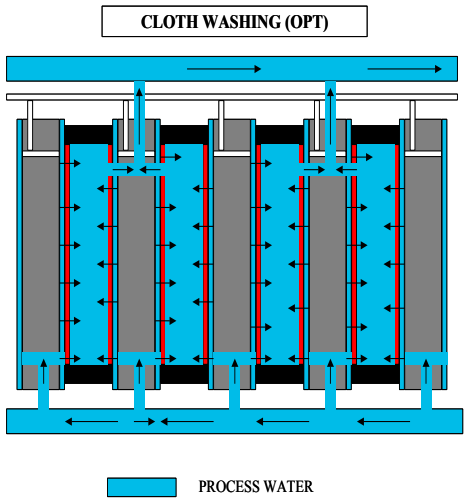
| **Cake discharge**. Positive, automatic cake discharge is guaranteed with every cycle. The cake can be discharged on a conveyor belt. |  |
| **Cloth washing (optional).** The cloths are washed by means of back-washing via the filtrate ports through the drain grooves. Cloths are washed by means of back-washing via the filtrate ports through the drain grooves. This method does not only remove solids captured in the weaves of the cloth, but also flushes the feed ports and slurry distribution pipe of the filter unit. |  |

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