

Tube Press

High pressure filtration



Laboratory
and pilot
testwork



High pressure filtration laboratory and pilot testwork

The fundamental basis of any Tube Press application is an accurate assessment both of the core process, and of the associated mechanical and operational criteria.

Metso has well equipped facilities, with personnel who have long experience of solid / liquid separation.

Why mechanical dewatering?

In dewatering applications, the most important question is the cost involved to reduce the moisture content of a slurry / suspension; both in regards to direct equipment investment and operation costs. The most cost effective alternative is an energy free process i.e. sedimentation. However, as particles get finer more energy has to be introduced to separate solid and liquid. Super fine material often needs a thermo drying step at the end to reach the process target. With the use of mechanical dewatering instead of thermal drying, significant cost saving and cost control is achieved.

The use of high pressure filtration often gives the final rest residual and cake features that the process requires with less energy usage. Reducing moisture is a question of energy added. A single full size Tube Press can operate with just 11kW installed power. With test work, basic data for the specific material can be obtained including: equipment selection, residual moisture, filtration capacity and basic plant scaling.

Laboratory test work

At Metso's laboratories properties of a sample can be tested and evaluated including particle size distribution, viscosity, pH, settling, effect of pressure (vacuum – high pressure) flocculants, temperature and filtering aids.

With the Metso piston press the filtration characteristics under high pressure can be evaluated. The piston press is a standard laboratory filter, capable of filtering slurries at pressures up to 100 bars.

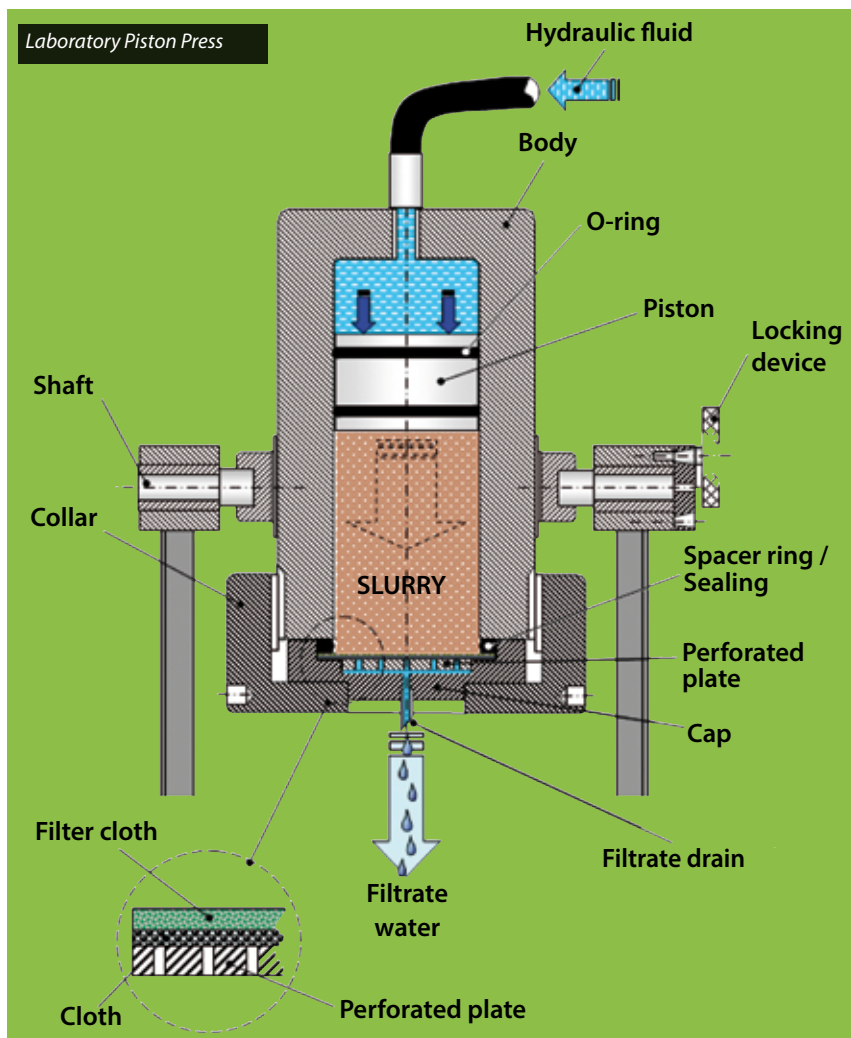
Elements that affect performance:

- Temperature (viscosity)
- Pressure
- Air blow
- Solid concentrations in slurry
- Cloth selection
- pH
- Filter aids (hydrophobism)

- Particle shape and size (flocculants)
- Granulation via pressure

The pressure and air effect on residual moisture

With the tube press pilot unit, full scale tests can be done to evaluate the effect of pressure and air drying. By the use of mechanical high pressure even strong capillary forces can be overcome. The additional use of air blow, where air is forced through the filter cake by hydraulic pressure, will further reduce the filter cake residual content.



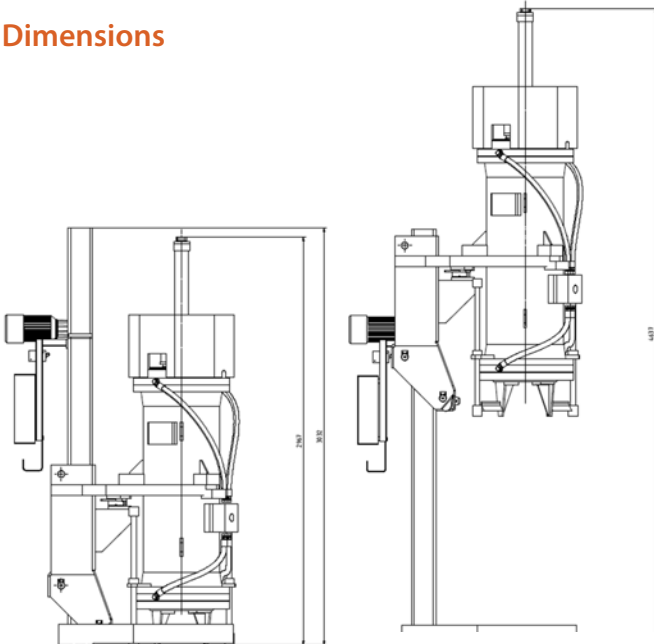
Pilot test work and features

The tube press test unit SC 500-12/75 is a stationary fully automated pilot plant used to evaluate filtration characteristics of a specific slurry at Metso's laboratories. The test plant is installed indoor in an area where wet and dry material can be handled under full control. The pilot set up is a complete unit including tube, hydraulic booster, feed pumps, air compressor, hydraulic unit, control cabinet, filtrate tank and measuring equipment, etc.

The pilot unit includes all equipment to perform smaller scale tests as well as a piston press. The unit is equipped with sensors to allow for all necessary measurement of the filtration conditions, which will be the base for plant scale-up.

With the pilot unit process simulations can be run for all operating parameters which can be used in a full size plant including air-purge (pressing air through the cake) cake washing and cloth testing. In our laboratory we can perform settling tests and slurry modification to evaluate impact of parameters such as temperature, density and additives.

Dimensions



Sample condition and requirements for stationary pilot tube press

Samples for pilot test work is recommended to be representative with slurry as close to production condition as possible. Recommended volumes for test work depends on material condition and test requirements, typical volumes are 1000 - 3000 litre of representative slurry, sent in IBC (Intermediate bulk container) or equal.



Dry and wet samples are collected and can be resent in bulk bags and IBC containers.

Technical data for high pressure filter SC500-1,2/75

Pressure range: <100Bar

Chamber volume: 80 litre

Filtering area: 1,35m²

Features:

Cake wash / Cloth wash

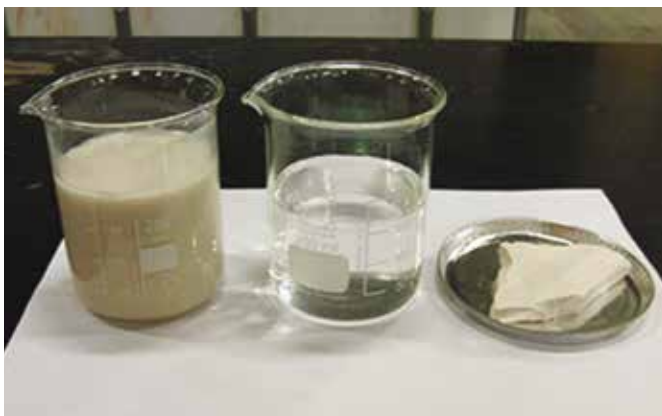
Air drying (Air purge)

Temperature range: <60°C (55°C)

Slurry feed pressure: <8bar

Wash water pressure: <8bar

Air pressure: <12bar (charge pressure)



Result and test report

From the result of the test we will provide a detailed report, documenting test conditions, result, analyzes and other relevant information. We can supply cake as well as filtrate sample from performed testwork.



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