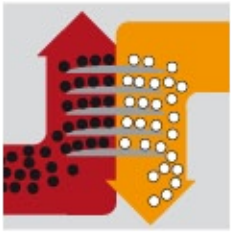
BHS Pressure Plate Filter

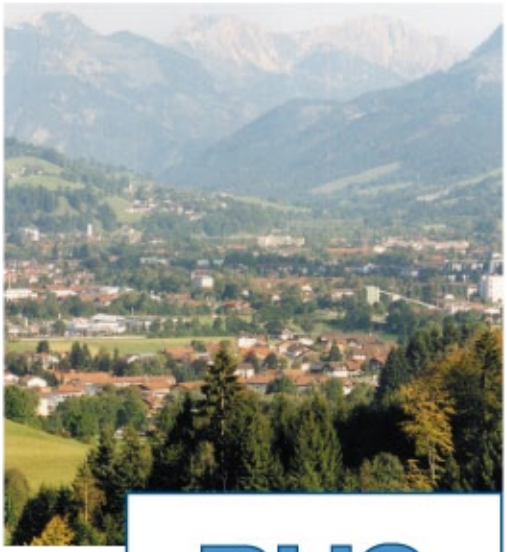
Solid-liquid separation –
recovery of solids and filtrates.

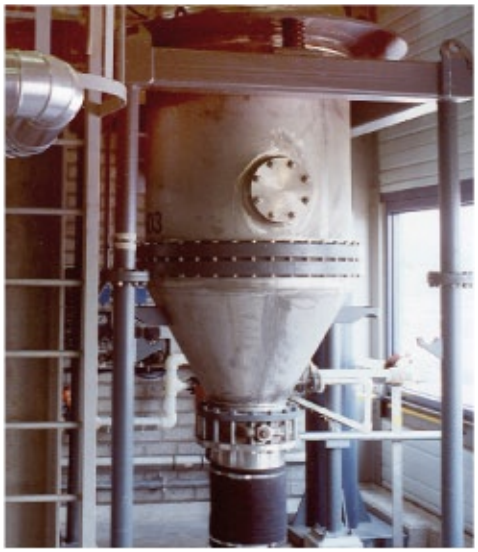


BHS
SONTHOFEN

BHS-Sonthofen

Innovative
and competent.





The BHS plant in Sonthofen. For centuries a driving force behind the economic and technological development of the Allgäu.

Tradition at BHS-Sonthofen goes back to the year 1563. In those days, the site of the factory was used for smelting iron ore from the surrounding area. The pig iron that was produced went to the local nail smiths and armourers. The 19th century then saw the advent of mechanical engineering. Numerous patents from that time bear witness to the company's longstanding tradition of technical inventiveness, earning it a place among the market's best. Filtration systems for separating solids and liquids have been in production for over 50 years. Today, BHS-Sonthofen is an independent medium-sized hi-tech company with activities all over the globe. It has extensive experience in using filtration systems for reliably and rationally separating suspensions of all types, providing the appropriate solution to any problem definition. BHS Pressure Plate Filters have been in use for several decades in hundreds of applications world-wide to the tremendous satisfaction of its operators.

Applications and benefits

The BHS Pressure Plate Filter is installed for a wide range of uses and applications.

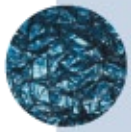
Pharmaceuticals, antibiotics, medical products
GMP demands the very highest quality of equipment for product processing in terms of contamination risk and prevention of leakage.

Plant extracts, antibiotics, fermentation broths, substrates, vitamin solutions

Pharmaceuticals, antibiotics & medical products

Catalysts, activated carbon, bleaching earth
There is a wide variety of applications including the separation and recovery of reaction components as well as adsorptive filtration processes for clarifying and decolorizing different kinds of solutions.

Flammable catalysts, activated carbon, precoat filtration, removal and decolorization



Catalysts, activated carbon & bleaching earth

Inorganic salts, acids, lyes
Regardless whether residues from acids and brines, salts from saturated solutions or lyes are to be filtered using activated carbon, the pressure plate filter provides particle-free filtration at highest throughput rates.

Caustic soda solution, caustic potash solution, brine, sulfates, carbonates, hydroxides

Inorganic salts, acids & lyes

Oils, resins, paints
Products of highest viscosity can be processed at hot temperatures. Oils are filtered free from particles and decolorized. Initial and intermediate products can be treated within an inert chamber to prevent bonding and hardening.

Silicone oils, edible oils, resins, paints, intermediate plastic products, melamine, caprolactam

Oils, resins & paints

Mineral products
Highly-viscous sodium silicate solutions can be processed on textile and special steel fabrics in the same way as slurries containing strongly abrasive mineral products, since there are no moving parts exposed to the product.

Sodium silicate, aluminum oxide, silicon carbide

Mineral products

Organic products
The BHS Pressure Plate Filter is well suited for the processing of slightly volatile or toxic organic solvents, since no leakage can be caused by shaft seals and all components can be made of chemical-resistant material.

Methanol, toluene, benzene, alkylphenol, tar, peroxide, amino acid, fumaric acid, citric acid, detergents

Organic products

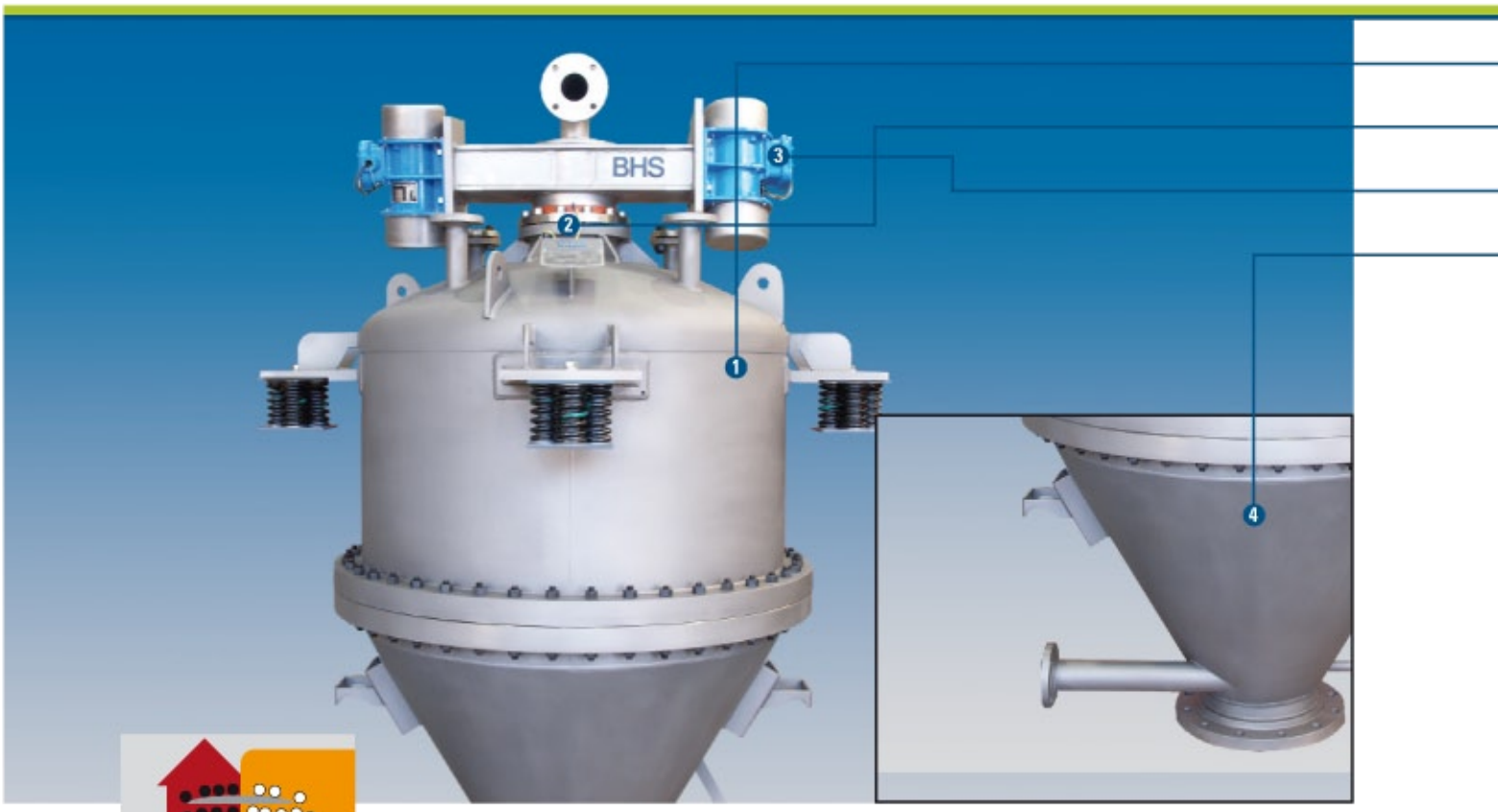
Applications in environmental technology
High throughput rates and optimized cost processes are the criteria demanded for the filtration of by-products and wastewater.

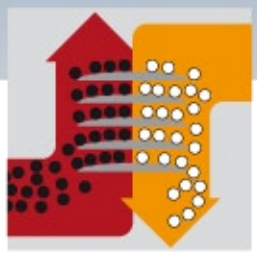
Industrial effluents, fly ash, pickling acids, fine soot, wastewater containing arsenic, power station effluents

Applications in environmental technology

BHS Pressure Plate Filter

Batch operated filter for the most stringent requirements for filtration, clarification and recovery operations.





Precoating, filtration, washing, extracting, steaming and blowing

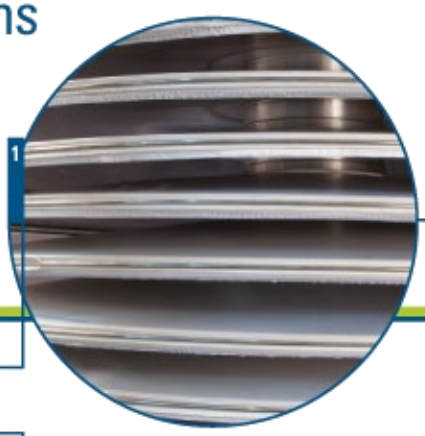
The BHS Pressure Plate Filter is a batch operated filter with high operational safety. It is used primarily for separating solids/liquids in average to poor filtering suspensions with relatively low solids content, for adsorptive filtration processes (adsorption using activated carbon) as well as for clarification filtration processes.

A filter cake is formed under pressure on the top of each plate. The filtrate is discharged through a hollow shaft. After washing, steaming or blow out, the filter cake is removed from the plates by means of vibration and discharged at the bottom.

An exact separation of the batches can be accomplished by adding a heel filtration vessel. Its enclosed design is particularly suitable for the filtration of solvents and products that require special safety measures for reasons of toxicity.

Specifically designed for your applications

A filter engineered exactly to your separation activities.

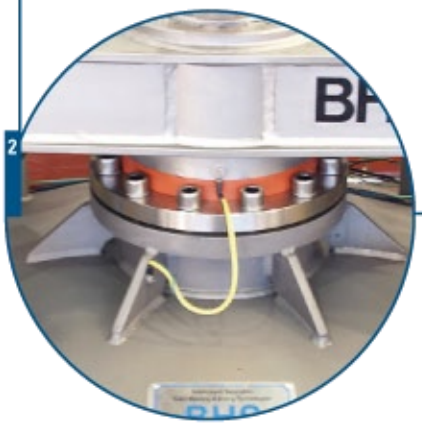


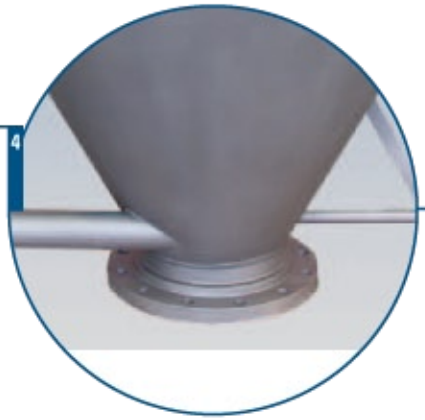
1 Set of plates

2 Shaft seals

3 Unbalance motor

4 Heel filtration equipment





1 Set of plates

The filter elements consist of slightly sloped, cone-shaped metal plates supporting a coarse mesh backing screen. These plates are covered with the actual filter cloth to retain the cake. The filtrate travels up through the central manifold as a result of the prevailing pressure differential. The filter plates are connected to each other via hubs that are provided with a special gearing and four tie rods to produce an absolutely positive fit. The filter medium is fastened to the shaft side with a static, elastic shaft seal and to the plate rim by a clamping ring.

2 Shaft seals

Sealing between the filter vessel and the vibrating plate stack is kept very simple using a radially acting static sealing collar clamped by straps to the hollow shaft and vessel support ring. Under extreme conditions (high temperatures, chemically aggressive media) the elastomer collar can be coated with a shrinkable sleeve made of PTFE like material. This static sealing of the process chamber ensures an enormous operational safety of the plant even under extreme conditions.

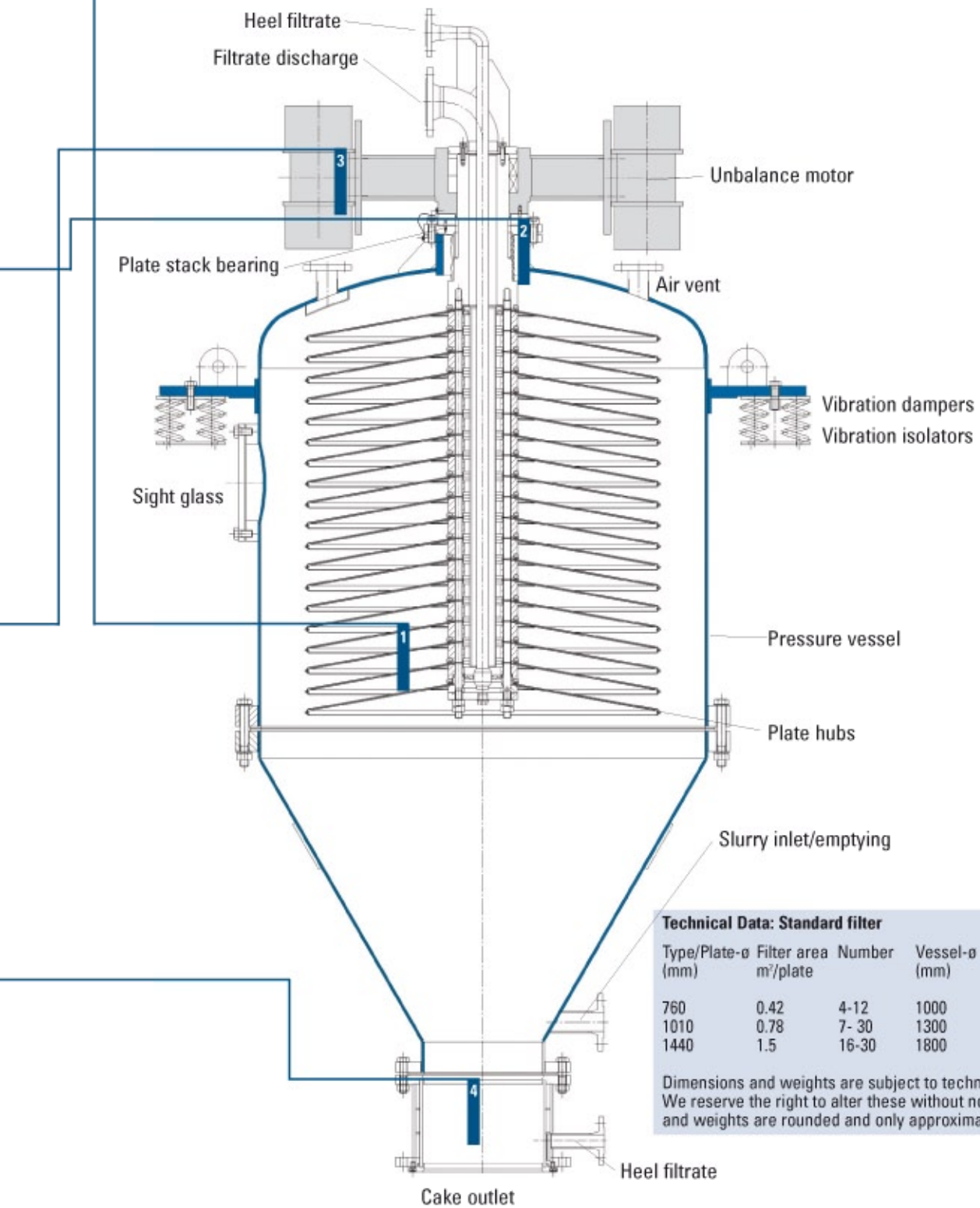
3 Unbalance motor

The filter cake may be discharged as a wet sludge without dry blowing or as a dry cake. The complete set of plates with hollow shaft and drive arm are seated on a flexible synthetic ring. Two unbalance motors – mounted at a slight angle to the drive arm – run synchronously with weights offset by 180°. These set the plate stack in horizontal and vertical oscillations, causing the filter cake to break up and move outwards over the rim of the plates. The vessel is supported on isolators which absorb vertical oscillations. The cake drops into the cone shaped lower part of the vessel for discharge.

4 Heel filtration equipment

Additional filter elements (filter plates) can be used to reduce the heel volume in the vessel cone. For a nearly complete heel filtration a filter cylinder can be flanged to the bottom of the vessel, which can also be retrofitted.

The BHS Pressure Plate Filter at a glance



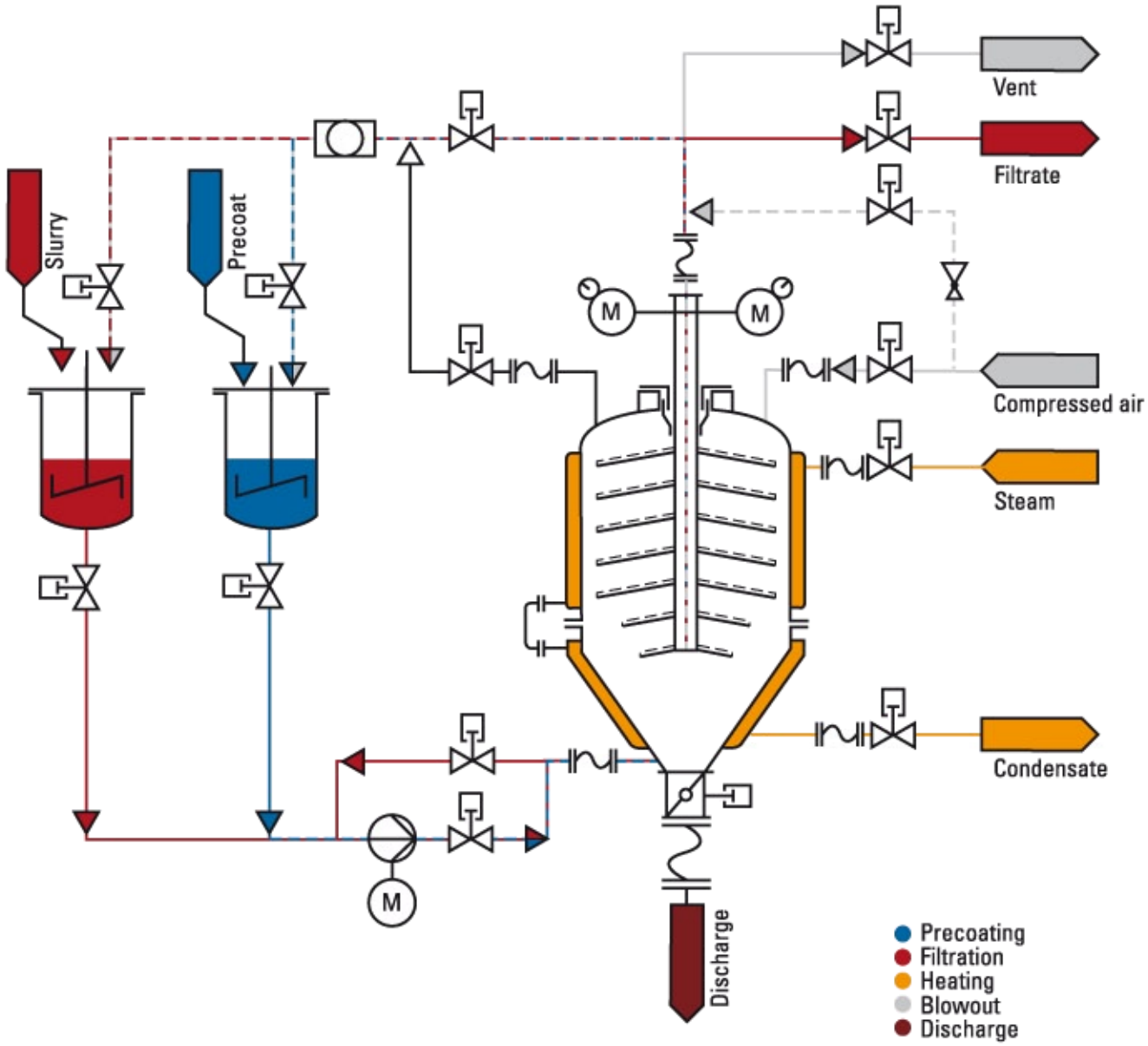
Technical Data: Standard filter

Type/Plate-ø (mm)	Filter area m²/plate	Number	Vessel-ø (mm)	Filter area (m²)
760	0.42	4-12	1000	1.7-5.0
1010	0.78	7- 30	1300	5.5-23.4
1440	1.5	16-30	1800	24.0-45.0

Dimensions and weights are subject to technical development. We reserve the right to alter these without notice. Dimensions and weights are rounded and only approximate figures.

Possible integration of a BHS Pressure Plate Filter

Example of a flow chart with precoat filtration.



Operational details

A batch operated pressure filter for clarification of slurries and recovery of solids.

Filtration

Cake forming

Filtrate separation

Cake formation

The BHS Pressure Plate Filter is ideal for many separation tasks.

Resulting from the prevailing pressure differential the solids are retained as filter cake on the top of the slightly conical plates. The filtrate flows through the forming filter cake and filter cloth, whereupon it passes across the coarse-mesh supporting fabric to the center of the hub. From here it travels to the central filtrate pipe which is firmly fixed to the set of plates and then discharged upwards through a coaxial dip pipe.

Adsorption

Cake washing

Cake extraction

Post-treatment

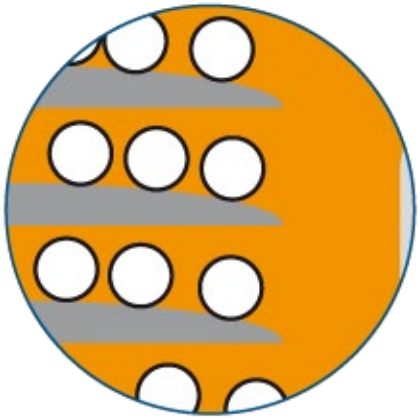
In many cases the built-up filter cake serves as a precoat layer and the liquid to be clarified can flow through it.

Thus, finest particles or colloids accumulate on the filter cake as a result of the adsorption forces. The duration of adsorption depends on the saturation load of the adsorbing agent.

Dissolved substances are removed out of the pores of the filter cake layer by means of displacement washing. The washing medium is pumped into the vessel, pressed through the filter cake and discharged through the filtrate outlet system.

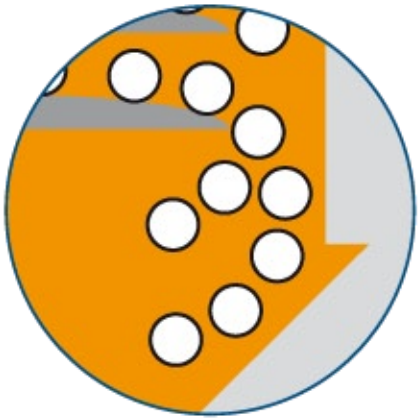
This procedure can be repeated using various washing media.

Cake dewatering
Drying
Steaming



The drying phase
Subsequently, the filter cake is dewatered. Usually, this is by blowing either air, nitrogen or other gases through the pores, at ambient or high temperatures. Steam can also be used to assist the dewatering or drying process.

Cake discharge
Filter cloth cleaning



The cake discharge
An easy and complete cake discharge is critical for a fully automatic filter operation.

The unbalance motors set the entire plate stack into defined vertical and horizontal oscillations. These oscillations cause a resonance in the filter cake on the plates. The cake cracks open and is pushed outward over the rim of the plates and finally discharged through the vessel cone.

The cloth is cleaned by vibrating the plate stack in the vessel filled with liquid. This very uniform dissipation of the vibration energy in the liquid provides an extremely efficient cleaning effect.

BHS-Sonthofen – the experts in filtration, cake washing and drying operations.

We can solve your difficult filtration problems early in the project phase. In order to determine the BHS Pressure Plate Filter best suited to your application, BHS conducts special trials in our testing facility – with your actual slurry.

We work with you to develop a concept for the overall system, including flow diagrams for each filtration process, engineering and programming for all of the process sequences.

Challenge us today to meet your project objectives!

Other Products:

Rotary Pressure Filters

Candle Filters

Autopress

Belt Filters

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