TÜV INDIA
ISO 9001 Certified

www.avtf.in

An affordable, profitable and sustainable alternative to conventional filtration systems.

AVTF™

AUTOMATIC VERTICAL TOWER FILTER

INTRODUCTION

AVTF™ is a fully automated labor-free pressure-driven filtration system is applied to process and waste slurries for filtering, clarifying, filter cake washing and extraction, and dewatering. It can dewater all types of slurries or suspension mixtures (toxic, corrosive, abrasive, and flammable) containing particles of different sizes in large volumes and varying process conditions within a single unit.

The equipment uses a hydraulic system to keep the plate pack assembly (filtration chambers), stacked one above the other, closed during the entire filtration cycle, and open them before filter cake discharge. It employs a rubber diaphragm for increased moisture removal and mechanical compression & stabilization of filter cake. It also uses compressed air for maximum reduction of adhering moisture from the filter cake. This combination makes it ideal equipment to filter even difficult & slow filtering materials.

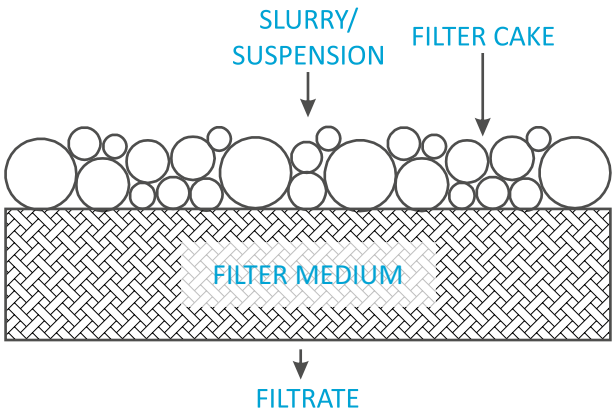
It consumes less utility, requires less labor, removes more moisture, and reduces filtrate treatment costs, making it an affordable, profitable, and sustainable alternative to conventionally used filtration systems for chemical manufacturing and allied industries.

CLASSIFICATION

01. Driving Force: Pressure
02. Filter Type: Surface Filter
03. Filtration Mode: Batch
04. Filter Medium: Filter Cloth
05. Feed Type: Suspension/Slurry
06. Moisture Removal: Unbound
07. Operational Area: Hazardous/Safe
08. Automation Level: Fully Automatic
09. Solid Concentration: >1%
10. Particle Size: 5 < x < 50 µm
11. pH: 0 - 14
12. Customization: As Per Client

MECHANISM

In AVTF™, the direction of feed flow is normal to the filter medium. The slurry or suspension containing solid particles of different sizes is stopped on the filter medium surface and accumulates as a filter cake. The larger particles of the suspension form the filter cake's skeleton, and the smaller particles can migrate into and deposit within the porous filter cake created by the large particles. The filter cake then functions as a medium for the filtration of subsequent input slurry or suspension.



APPLICATIONS

01. Pharmaceutical and Biotechnology
02. Food Processing and Beverage
03. Metal Salts and Mining & Minerals
04. Solid and Liquid Waste Management
05. Fertilizers, Pulp & Paper and Paints
06. Fungicide, Herbicide & Insecticide
07. Pigments and Dyestuffs
08. Petrochemicals, Paints and Polymers

ADVANTAGES

01. It reduces manpower costs by 80%.
02. It reduces filtrate treatment costs by 60%.
03. It reduces electric power consumption by 60%.
04. It reduces fresh water consumption by 30%.
05. It reduces downstream drying costs by 20%.
06. It ensures 95%+ filter cake wash efficiency.
07. It produces filter cakes as dry as 85% solids.
08. It requires smaller footprint.

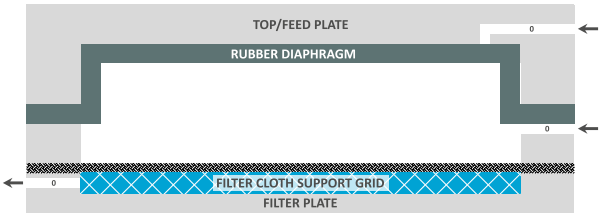
A PROFITABLE ALTERNATIVE FOR

01. Agitated Nutsche Filter
02. Plate & Frame Filter Press
03. Pressure Leaf Filter
05. Basket (Peeler) Centrifuge
06. Belt Filter Press
07. Vacuum Pan Filter
09. Rotary Vacuum Drum Filter
10. Decanter Centrifuge

OPERATION

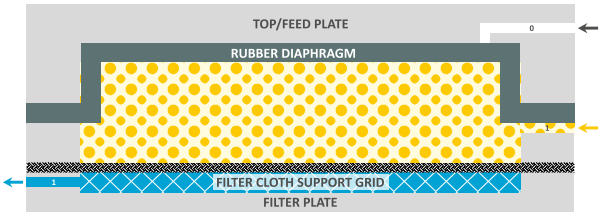
AVTF™ works on two basic principles: Differential Pressure & Particle Size Distribution.

STEP 01: PLATE PACK ASSEMBLY STANDBY



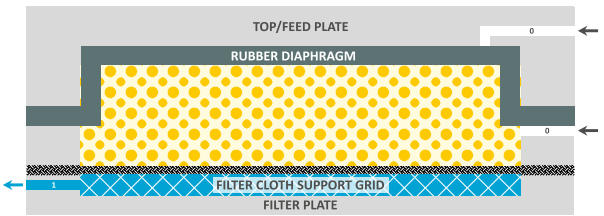
At this stage, the plate pack assembly (filtration chamber) is locked under pressure for filtration using a hydraulic system.

STEP 02: FILTRATION - SLURRY ON



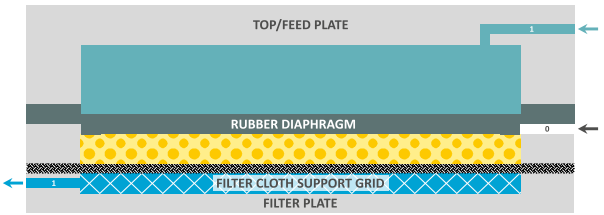
At this stage, a suitable pump is used to simultaneously pump the slurry or suspension mixture into all the filtration chambers. As the pumping pressure increases, the solid particles are retained by the filter medium (filter cloth) surface and accumulate as a filter cake. Subsequently, more filtrate is pushed through the filter cake and filter cloth owing to rising feed pressure. The pumping of slurry is continued until the desired cake thickness has been achieved. The filtrate is drained through the ports of each filtration chamber.

STEP 03: FILTRATION - SLURRY OFF



At this stage, the pumping of slurry to the system is discontinued. Any excess slurry fed to the system is removed via the bypass valve. The pressure inside the filtration chamber is brought down to atmospheric pressure. The filtrate is drained through the ports of each filtration chamber.

STEP 04: PRE-SQUEEZING



At this stage, a rubber diaphragm located at the top of each chamber is inflated (using high-pressure raw water) for mechanical compression and stabilization of filter cake. This action helps in reducing the chamber volume and squeezing the filter cake to remove more filtrate, thereby increasing filtration efficiency. The filter cake is squeezed to a uniform thickness producing a homogeneous cake, subsequently enhancing cake washing and air blowing steps. The filtrate is drained through the ports of each filtration chamber.

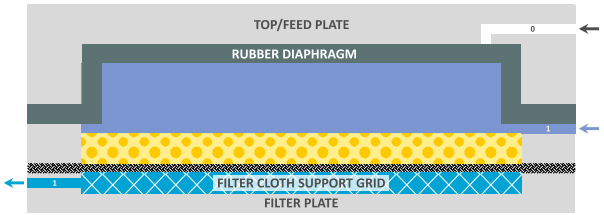
LEGEND

- No Input/No Output
- Feed Slurry Inlet
- Filtrate Outlet
- Squeeze Water Inlet
- Cake Wash Liquid Inlet
- Compressed Air Inlet

- Filter Cake
- Filter Cloth
- Filter Cloth Support Grid

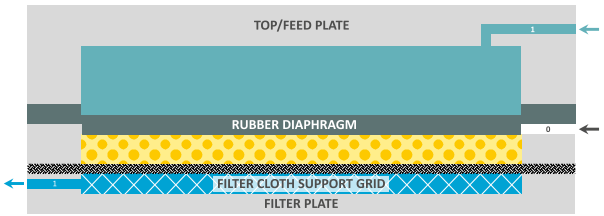
0: Valve Closed | 1: Valve Open

STEP 05: FILTER CAKE WASHING



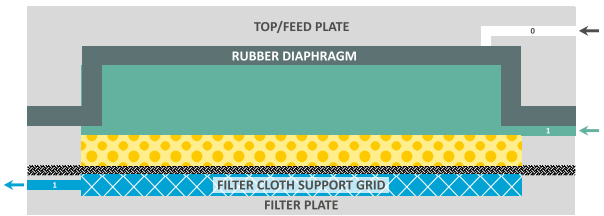
At this stage, suitable wash liquid (if required) is pumped into the system to remove solubles from the filter cake. The wash liquid is distributed evenly across the filter cake due to the homogeneous cake surface produced by the pre-squeezing step combined with the filter plate's horizontal configuration. The filtrate, along with wash liquid, is removed through the ports of each filtration chamber.

STEP 06: POST-SQUEEZING



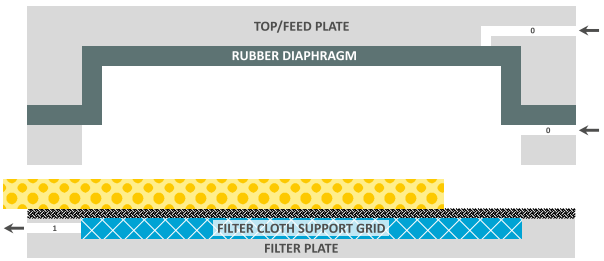
At this stage, the rubber diaphragm at the top of each chamber (using high-pressure raw water) is re-inflated to remove the remaining wash liquid from the filter cake. This action helps achieve a washing efficiency of over 95% while producing consistent dry solids quality and ensuring the minimum possible wash liquid volume. The filtrate is removed through the ports of each filtration chamber.

STEP 07: COMPRESSED AIR BLOWING



At this stage, compressed air is blown into the system (rubber diaphragm side) to displace residual liquid medium in the cake. During this step, the rubber diaphragm at the top of each chamber is usually kept inflated to maintain cake stability and thickness. This arrangement reduces air consumption and ensures the lowest residual filter cake moisture. The filtrate is removed through the ports of each filtration chamber.

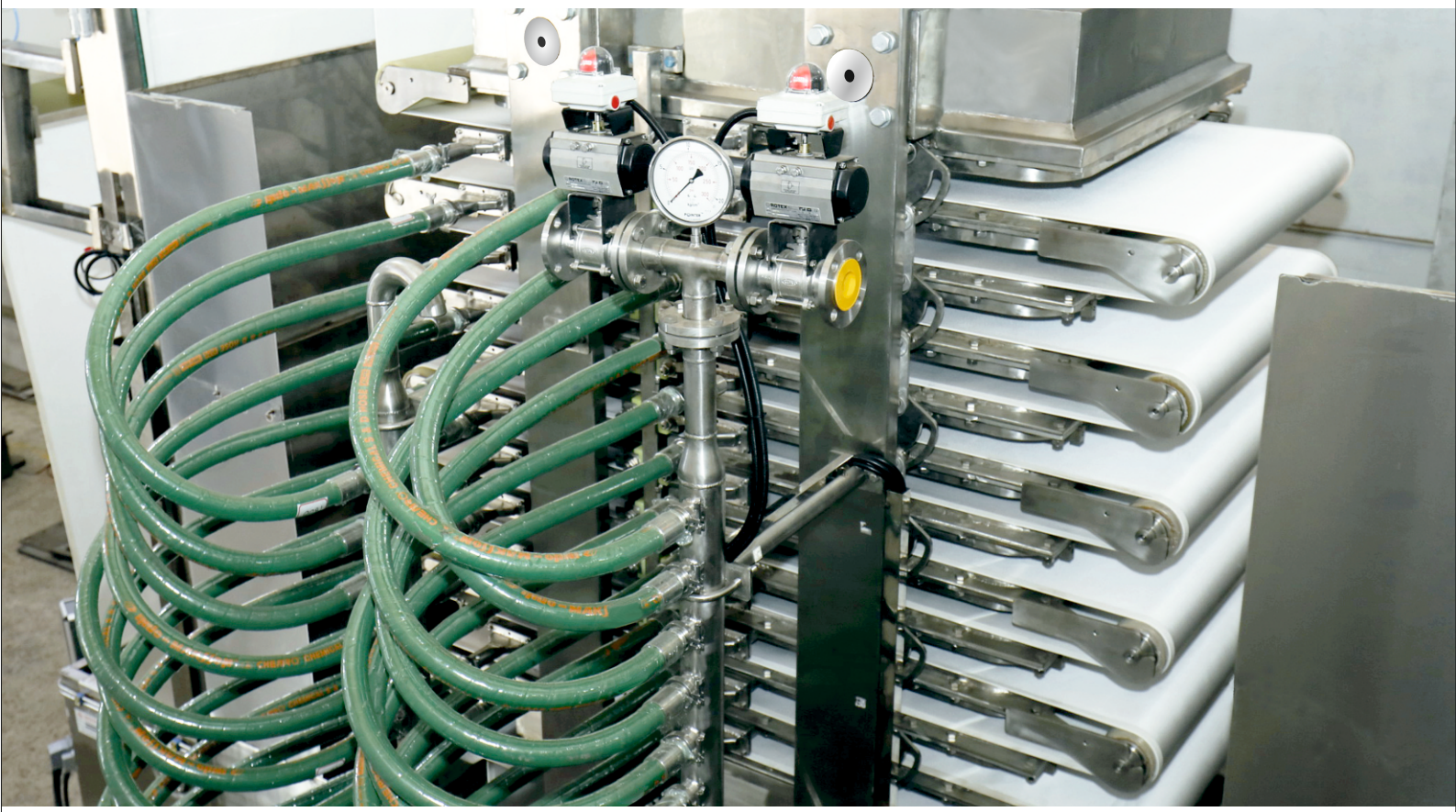
STEP 08: FILTER CAKE DISCHARGE



At this stage, the plate pack assembly (filtration chamber) is opened up using a hydraulic system. The filter cloth is set into motion, conveying the filter cake from the filtration chamber to the collection hopper. A scrapper assembly on every filtration chamber ensures the residue-free discharge of filter cake.

The filter cloth is then automatically passed through a filter cloth wash unit that sprays high-pressure water on both sides of the filter cloth to dislodge any entrained particles. This process helps minimize filter cloth blinding, increase filter cloth life, and generate consistent filtration results. The total cycle time for any product depends on the filter cake's characteristics.

DELIVERING WITH DISTINCTION



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