PRS TECHNOLOGY

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AGITATED NUTSCHE FILTER & FILTER - DRYERS

INTRODUCTION

PRS TECHNOLOGY ANF and ANFDs are used for solid-liquid separations under pressure & or vacuum. The closed operation ensures a consistent product quality, simple validation and also a required operational safety.

The advanced combination of agitation & hydraulics used in these filter / dryers make them versatile and user friendly. The resulting wet cakes can be re-slurried and washed thoroughly with water or solvents unlike manual Nutsche Filters and Centrifuges.The discharge of cake is automatic. If the process demands filtration in a hot or chilled condition the same can be achieved.

Finally drying operations can also be conducted within the same equipment.

1m≈ ANF with Detachable Bottom

APPLICATIONS

PRS TECHNOLOGY filter & dryers are successfully installed in the Inorganic and Organic Chemical, Fine chemical and most importantly in the Pharmaceutical Industries.

These filter-dryers can be customized for various processes such as Crystallization, Filtration, Decoloration, Washing & Drying with a variety of options namely different shaft seals, bottom enclosure mechanisms, CIP etc .

The size or selection of a filter/filter-dryer is purely determined by the volume of cake to be handled in a batch & also the nature of the material to be filtered.

We offer various sizes ranging from 0.1m≈ to 15m≈.

MATERIAL OF CONSTRUCTION

PRS TECHNOLOGY filter/filter dryers are offered in Stainless Steel, Hastealloy and Special alloy metals. For highly alkaline/acidic products we offer various compatible grades of Lined or Coated flouro polymer such as Halar, PTFE, PVDF etc. Typically in such Filter/ Dryer Only the Agitator shaft & blades are supplied with exotic materials.

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PILOT PLANT FOR TRIALS

PRS TECHNOLOGY offers Pilot Filter Dryer for site trials. The clients can gain first hand experience on the performance of the equipment & also the the process adaptation on their products . The same can be utilized for reliable scale-up and process data. Our engineers welcome the opportunity to work with the customers to find the right solution.

We cherish to share our experience of 20years in field of manufacturing designing & supply of these Filter / Dryers.

DETACHABLE BOTTOM FILTER

PRS TECHNOLOGY filter/filter-dryer variant with detachable bottom is lifted and lowered by a combination of 3 Nos hydraulic cylinders. This method of descending / ascending lower chamber assists in a quick changing of filter cloth and simultaneously product change.

AGITATED NUTSCHE FILTER DRYER

PRS TECHNOLOGY ANFD are used for filtration & drying materials in a single charge without vessel tranfer.

After filtration the product is kept under agitation and heated from shell, bottom and the agitator blades.

The vapors are condensed through a product filter from the top of the ANFD.

The drying time is reduced due to vacuum system & solvents are recovered.

4m≈ - Agitated Filter Dryers

SIDE DISCHARGE VALVE

Plug type side discharge valve is provided with a metal to elastomer sealing.

Specially designed metal to metal sealing is available as an option.

Online sampler can be provided as an option .

HYDRAULIC POWER PACK

As an option we can offer Hydraulic Power Pack with hand operated-lever type valves or electrically operated solenoid valve in a FLP box.

The unit is designed for :

1.Agitator up/down movement.

2.Discharge valve open/close.

3.Detachable bottom raise/lower.

FILTER MEDIA

FILTER CLOTH

SINTERED MESH

Filter media is selected based on process requirements. These can be either synthetic fibres, metal wire cloths or multilayered sintered metal. The segmented design for holding the filter media prevents the ballooning of the cloth.

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For Pharmaceutical products the following Features are a standard supply :

- Quick opening detachable bottom
- CIP Arrangement
- Steam sterilizable
- Online sampling valve
- Sintered metal filter or filter media
- Agitator with Mechanical seal
- Comply GMP standards
- Metal to metal sealing discharge valve

MECHANICAL SEAL WITH BELLOW

Double Mechanical seal dry or wet type can be provided on the filter/filter dryers. These seals have a expansion bellow extended on the shaft. Standard model filter/ dryer are provided with stuffing box with PTFE inserts. Also, FDA approved gland packings can be supplied for pharma models.

AGITATOR

Special agitator design helps various processes of filtration, drying and discharge of the product. The 'S'-type agitator blade (with 2 arms or three arms) are able to handle liquids as well as solids.A scraper at the centre hub prevents product adherence & localised heating.

CONTROL PANEL

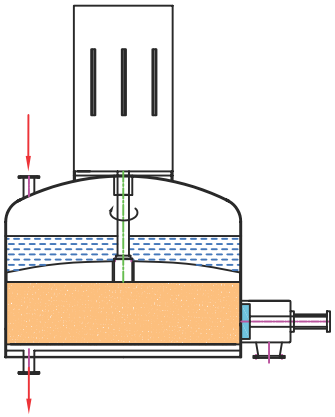
Explosion Proof & Flame Proof local Control Panels are provided on the filter / filter-dryers. Various Operations on the equipment can be monitored and controlled by a single operator. Control Panel with PLC is available as a option.

The agitator design performs both operation of cake compacting / smoothening & cake breaking/removal during opposite rotations .

PROCESS STEPS DURING FILTRATION (& DRYING)

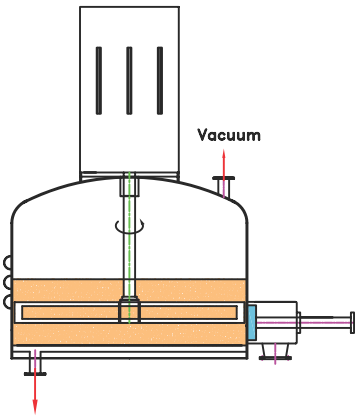
CHARGING & FILTRATION

Filtration depends very much on the characteristics of the products. Filtering experience can be gained by carrying out tests in small scale lab units. Experience has shown that the majority of filtrations are done in the range of 1.5 to 2.5 bar. To assist in filtration, vacuum can also be pulled underneath the filter media.



DRYING UNDER VACUUM

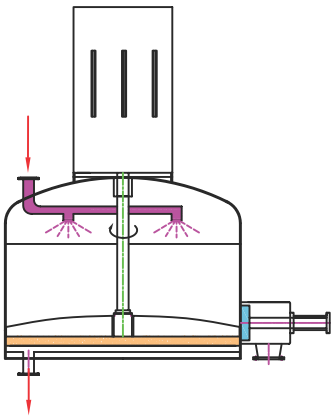
Drying is aided by vacuum, heatable blades,half pipe coil on the shell and Heatable filter plate. All around heat input ensures very efficient drying under vaccum A bag or cartridge dust filter is installed on the top Cover to trap and return any dust entailed in the vapor exiting the vessel.



WASHING/RE-SLURRY

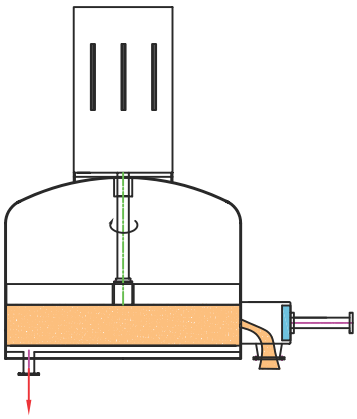
The ideal washing procedure is established by trials. Less porous, Crystalline particles usually need a displacement washing while porous, lamina-like products are preferably washed through a re-slurry washing.

However in many cases a combination of both show the best results.



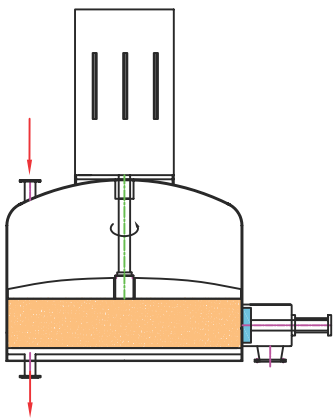
DISCHARGE

Cake is discharged automatically by opening the discharge valve and rotating the agitator, thereby avoiding operator contact. Discharging can be done in an inert atmosphere for the further processing of the cake. The rate of discharge can be controlled by varying the speed of agitator lowering and speed of rotation.



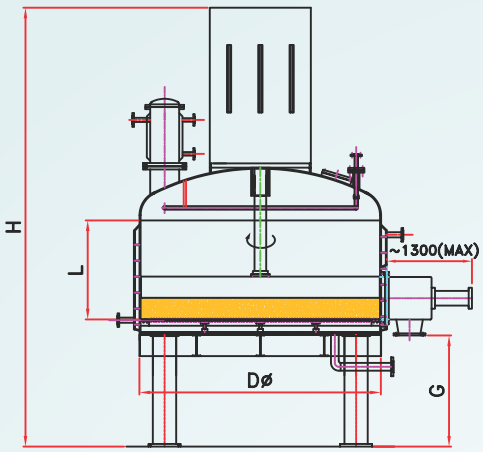
CAKE PRESSING / SQUEEZING

Cake pressing is done to remove any cracks formed on the cake. This is effected by applying pressure on the cake surface by means of the agitator. After final washing, cake can be squeezed by this method to allow further de-watering, reducing the residual moisture content.



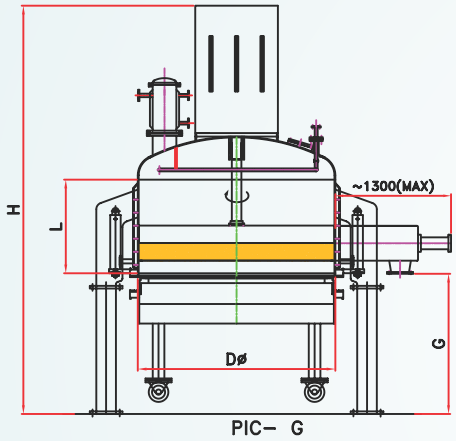
ANF/ANFD ADVANTAGES

- Maximum safe operating environment for product & operator
- Toxic & hazardous material/product can be processed with washing & repeat washing with water / solvents
- Maximum heel recovery of product
- Reduced product contamination & Reduction in Capital cost due to multiple operations such as Crystallization, Intermediate hold essel Re-slurry Vessel & Drying within single unit.
- Bulk quantities can be processed in a single bath & hence reduced filtration & drying times.
- Easy discharge of cake / powder compared to other filter/dryers.
- Full automation is possible



PIC – F

Model No	Nominal Filtration	Working Volume	Max Cake Volume	Max Cake Thk	Vessel Ground Dimension		Overall Clearance	Motor Height	HP	
					Shell ID	Shell Height			ANF	ANFD
					D	L	G	H		
	M^2	Liters	Liters	MM	MM	MM	MM	MM	HP	HP
SAP-ENC-10	0.75M^2	500 L	157	200	1000	600	650	3450	3	5 HP
SAP-ENC-12	1.1M^2	750 L	271	240	1200	650	650	3450	5	5 HP
SAP-ENC-15	1.75M^2	1250 L	530	300	1500	700	650	3600	7.5	7.5 HP
SAP-ENC-16	2M^2	1500 L	643	320	1600	750	700	4250	10	10 HP
SAP-ENC-20	3M^2	3000 L	1256	400	2000	1000	750	4250	10	12.5 HP
SAP-ENC-22	4M^2	4000 L	1788	450	2250	1000	750	4250	10	12.5 HP
SAP-ENC-25	4.3M^2	5000 L	2453	500	2500	1000	750	4350	15	15/20 HP
SAP-ENC-28	6M^2	6100 L	3446	560	2800	1000	750	4450	15	15/20 HP
SAP-ENC-30	7M^2	7000 L	4239	600	3000	1000	800	4450	20	25 HP
SAP-ENC-35	9.6M^2	9600 L	6731	700	3500	1000	800	4600	20	25 HP



PIC– G

Model No	Nominal Filtration	Working Volume	Max Cake Volume	Max Cake Thk	Vessel Ground Dimension		Over All Clearance	Motor Height	HP	
					Shell ID	Shell Height			ANF	ANFD
					D	L	G	H		
	M^2	Liters	Liters	MM	MM	MM	MM	MM	HP	HP
SAP-TR-10	0.75M^2	500 L	157	200	1000	600	700	3500	3	5 HP
SAP-TR-12	1.1M^2	750 L	271	240	1200	650	700	3500	5	5 HP
SAP-TR-15	1.75M^2	1250 L	530	300	1500	700	700	3650	7.5	7.5 HP
SAP-TR-16	2M^2	1500 L	643	320	1600	750	750	4400	10	10 HP
SAP-TR-20	3M^2	3000 L	1256	400	2000	1000	750	4600	10	12.5 HP
SAP-TR-22	4M^2	4000 L	1788	450	2200	1000	750	4600	10	12.5 HP

OUR VALUABLE CLIENTS

GNFC, JUBILANT PHARMA, fbl Fermenta Biotech Limited, RPG LIFE SCIENCES LIMITED, Vihita Chem Pvt. Ltd., SANOFI, exemed pharmaceuticals, ONEIRO CHEMICALS PVT. LTD., amsal, OZONE LifeScience, RUTAIN, MACRO POLYMERS, MEMBA CHEM INDUSTRIES PVT. LTD.

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