



# PharmaChem Cosmetics Industries



WE MANUFACTURE MACHINERY & EQUIPMENTS FOR PHARMACEUTICAL, BIO PHARMA, BULK DRUG, FORMULATION, API, AYURVEDIC, HERBAL, FOOD, COSMETIC, CHEMICAL & BEVERAGES INDUSTRIES.

9 B / 14, RAM NAGAR, PREMSAMBANDH CHS, NEAR ASHOK NAGAR ROAD, BHANDUP - EAST, MUMBAI 400 042

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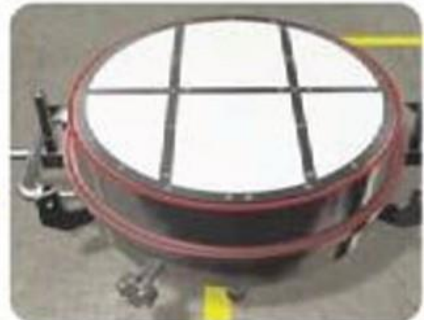
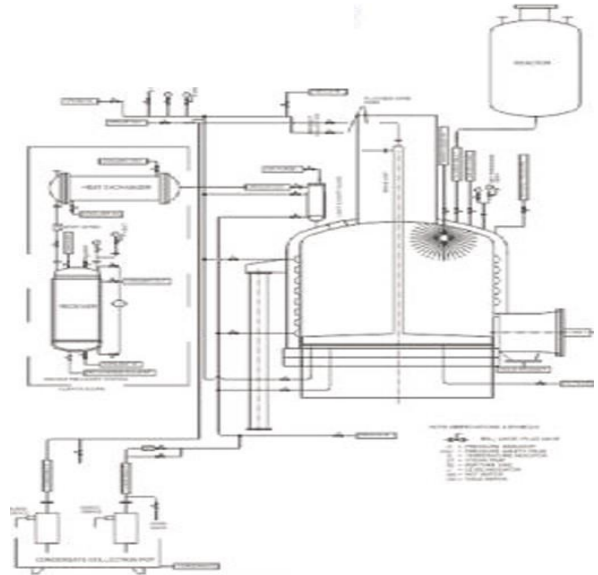
WEB : [www.PharmaceuticalMachineMumbai.com](http://www.PharmaceuticalMachineMumbai.com)

GST : 27ARUPP3866G1Z1

EMAIL : [Pharmachemcosmetics@gmail.com](mailto:Pharmachemcosmetics@gmail.com)



## AGITATED NUTCH FILTER DRYER



This is a combination of filter and dryer unit in single equipment to achieve economy in process, space and energy thereby improving profitability. This equipment can be used in manufacturing process of various Pharmaceuticals, Intermediate Compounds, Chemicals, Fine Chemicals, Agro Chemicals, Insecticides, Pesticides, Dyes and Food Products.

The Agitated Nutsche Filter Dryer is a closed vessel designed to separate solid and liquid by filtration under pressure or vacuum. The advanced technology of agitation and hydraulics used in the equipment makes it versatile and user friendly. The resulting wet cake can be reslurried and washed thoroughly with water or solvents unlike in untsch filters or centrifuges. Wash liquid quantity can be controlled and recycled, reducing effluent load. The discharge of wet cake is automatic. If the process demands filtration in chilled or hot condition, it is also possible. Drying of wet cake is also possible when drying features are incorporated. The unit consists of a totally enclosed and sealed cylindrical shell fitted with a agitator assembly which moves horizontally as well as vertically. The cylinder operates under pressure or vacuum or both. The closed operation ensures odorless, contamination free and nonpolluting working conditions maintaining product purity and hygiene. The equipment is functionally safe and easy to operate.

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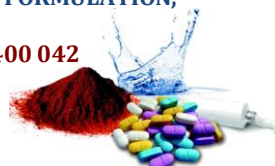
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employed for filtration process are also reduced. It has multi- functional utility, saves on power, labor, floor space, material wastage and time.

## CONSTRUCTION :

Additionally, the equipment is fitted with a stirrer mechanism which efficiently agitates the slurry during cake washing, smoothes and squeezes the cake during filtration and assists in the automatic discharge of the cake. A side discharge arrangement is provided, closing and opening through hydraulic / mechanical means. A filter plate with filter cloth is fitted at the bottom of the shell for separating liquids from solids. The cake is retained on top of the plate. The upward and downward movement of the agitator assembly is utilized for cake washing, compressing, drying and discharge of the cake. A vacuum pump connected to receiver is installed for discharging of liquids and vapor collection. The cylindrical shell can also be provided with a jacket. A filter plate is located at the base of the vessel in level with the discharge port. The filter medium, usually a filter cloth, is fitted on the filter plate which is replaceable type.

In addition a special multilayered filter plate can also be provided instead of filter cloth. In dryer construction heating is provided on shell by limpet in bottom by jacket and through hollow agitator and blades. Vacuum is applied for fast drying.

It has multi- functional utility, saves on power, labor, floor space, material wastage and time. We use sophisticated technology that combines hydraulics and agitation, which makes the Agitated filter dryer easy to use and very versatile.

## SALIENT FEATURES :

- Designed and Manufactured to suit critical hygienic conditions of pharma and food industries. (cGMP MODEL).
- Operated by hydraulic cylinders and held tightly with zero leakage.
- Offered in various materials of constructions, like stainless steel, Hastelloy, Titanium, carbon steel, rubber lined carbon steel and lead lined carbon steel.
- Offered in a wide range of filtration area capacities from 25 Lits upto 10000 Lits.
- Method of operation is totally enclosed, neat and hygienic. These conditions are excellent for solvent recovery, Hollow Shaft and Hollow Blades for thorough drying.
- Suitable for handling of sterile compounds or toxic and hazardous materials without human intervention.
- Enables easy non-manual and automatic cake / solid discharge. Scraper blade is provided to scrap the material which may stay on shell.
- Hollow Shaft and Hollow Blades for thorough drying.
- Specially designed tank cleaning nozzle is provided for thorough cleaning of inside of filter body. (CIP)

## TECHNICAL DESIGN PARAMETERS :

Design Pressure	Vessel -Full Vaccum , Jacket/Limpet – 4bar
Design Temp	150deg
Finish	Internal: 240gr Mirror finish, External 180gr Mat finish

## OPERATIONAL SEQUENCE :

The operation of Nutsche Filters requires a complex manipulation of valves and hydraulics so present day installations are always semi or fully automated.



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## Filtration

The filter is charged with slurry and pressure is applied to displace the filtrate leaving the cake retained over the filter medium. For slurries with a wide distribution of coarse fast settling solids and slow settling fines there is a risk of segregation with the finer fraction settling over the coarse fraction. When this happens the fines seal the cake and slow down the cake formation so keeping the slurry in suspension with rotating arms during filtration assists in forming a homogeneous cake.

## Cake Washing

In the washing stage a spray ring or connections on top of the cover introduce the wash liquid over the cake. This displaces the mother solution with the wash liquid but with such in-situ washing the efficiency may be quite low if the cake forms with an uneven thickness.

One of the advantages of the Nutsche Filter is the ability to smoothen the cake's surface prior to applying spray wash so that the entire bed is washed evenly.

Washing efficiency may be further improved if air or gas are not allowed to enter the cake in a multi-washing system so the wash liquids always displace the solutions in a "piston" like manner. This is achieved by a special detector that monitors the surface of the cake for moisture and once air or gas start entering the bed a signal is transmitted to close the filtrate valve and reopen it once next washing commences.

## Cake Repulping

Many processes require high washing efficiency to remove the contaminating liquid from the product and washing the cake by repulping yields the most efficient product purity. This is done by resuspending the cake with the paddle arms for thorough mixing with the wash solution. During resuspension the rotating arms are moving slowly downwards and are "shaving" the bed gradually layer after layer until the entire cake enters the slurry.

## Pressure Drying

In the drying stage air or gas purges the cake until the captive moisture is reduced to an asymptotic level and in practical terms the cake is considered to be as dry as possible.

To obtain minimum moisture the cake is smoothened by reversing the rotation of the paddle or auger arms and exerting controlled pressure on its surface with the hydraulic system. This seals cracks in the cake so that air or gas will not bypass the bed.

## Vacuum Drying

Further reduction in cake moisture may be obtained by slowly rotating and lowering the paddle arms to scrape and de-lump the cake. To take advantage of the drying ability of the Nutsche Filter it is worth considering the option of heating components such as the vessel, filter floor and paddles to enhance drying.

## Cake Discharge

Once all the stages are completed the cake discharge valve opens and the paddle arms on the smaller machines or the auger arms on the larger ones are rotated and lowered to convey the dry cake towards the center. The same procedure also applies to side discharge machines however it should be noted that in this case the cake comes out intermittently and not continuously. This may have a layout impact on the downstream facility such as the conveyor that handles the product to storage.



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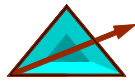
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On some filters the cloth or woven mesh screen may be backwashed with water to dislodge and remove any cake residue that adhered to the medium after cake discharge.

## TECHNICAL SPECIFICATIONS :

MODEL	ANFD-50	ANFD-100	ANFD-200	ANFD-300	ANFD-500	ANFD-1000	ANFD-1500	ANFD-2000	ANFD-3000	ANFD-5000
WORKING VOLUME	50	100	200	300	500	1000	1500	2000	3000	5000
CAKE VOLUME	25	50	100	150	200	400	750	1000	1500	2500
FILTER AREA	0.2	0.4	0.5	0.6	0.75	1.1	1.5	2	3	5
VESSEL DIA	425	600	700	800	1000	1200	1400	1600	2000	2500
VESSEL HT	400	400	550	600	600	900	1000	1000	1000	1000
BOTTOM OPENING STROKE	300	300	300	300	300	300	300	300	300	300
DISCHARGE VALVE ID	150	150	200	200	250	300	300	400	450	450
AGITATOR RPM	10	10	10	10	10	10	10	10	10	10
AGITATOR DRIVE	1	1	2	3	5	7.5	10	12.5	15	20
AGITATOR VERTICAL STROKE	200	200	200	200	250	250	300	400	450	450
AGITATOR UP DOWN SPEED	250	250	250	250	250	250	250	250	250	250
OVERALL DIMENSION	1300 X 1300 X 2400	1500 X 1500 X 2500	1700 X 1700 X 3000	1800 X 1800 X 3000	2000 X 2000 X 3300	2200 X 2500 X 3675	2300 X 2300 X 3800	2500 X 2500 X 3800	2800 X 2800 X 4375	3500 X 3500 X 4600
DESIGN PRESSURE	VESSEL – FULL VACUUM, JACKET / LIMPET – 4 BAR									
DESIGN TEMP	150 DEGREE									
FINISH	INTERNAL : 240GR. MIRROR FINISH , EXTERNAL : 180GR. MATT FINISH									



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