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# ABOUT US

**Nu Pharma** Machinery was setup in **2005** with the objective to develop & provide process technology offering of international standard **Nu Pharma** has full fledge manufacturing setup with proper infrastructure to produce equipment which are as per cGMP STD, Energy efficient and with design that have high level of performance & reliability.

Nu pharma machinery is certified with ISO and CE standard to achieve systemized manufacturing excellence

## Mission & Vision

#### Our Mission

To provide technical excellence through innovation, teamwork and commitment

#### Our Vision

To be a leading company in in the field of Pharmaceutical Process technology



# Qualification Documents





#### ROTOCONE VACUUM DRYER (RCVD) :

- Rotocone vacuum dryer is suitable for drying of materials which cannot resist high temperature, material which are easily oxidized, volatile materials which should be retrieved, materials which are strong irritants.
- The RCVD facilitates enhanced drying efficiency, low temperature operations and economy of process by total solvent recovery. It helps GMP based working by achieving optimum dust control, while offering advantages of efficient charging and discharging of material. The drying unit equipped with lump breakers initially breaks large lumps and subsequently powders them. The rotary action of the dryer together with mechanical action of the breakers, cuts down drying time and gives a lump free product
- RCVD is best suited for drying materials that are not capable of resisting high temperature levels and materials that
  are poisonous and strong irritants. These are also useful in averting oxidized and volatile materials that require to be
  retrieved. The equipment is ideally operated under vacuum.

#### • Salient Features :

GMP Unit, ideal for Pharmaceutical, Chemical & Food Industry.

Good for powder/granules, free flowing material.

Drying at lower temperature under vacuum.

Good solvent recovery.

Rapid and complete discharge.

Closed system – Automatic charging & discharging.

Provision of sampling port without breaking vacuum.

Provision for Lump breaker.

Provision for N2 pulsing & purging arrangement.

- Product Range: 100 Ltrs. to 10000 Ltrs.
- Condenser and Receiver are optional according to client requirement.\

#### SPECIAL FEATURE OF NU PHARMA RCVD

#### • STAY PIPE DESIGN

In earlier design of the RCVD spiral stiffeners were welded on the main shell to strengthen the mail shell. The bulging of the jacket and main shell during the running operation was minimized due to stay pipe design.

#### • GARLOCK SEAL (OPTIONAL)

Garlock seal design incorporated to eliminate the chances of the black particle from the vacuum pipe.

#### • STRENGTHENING OF THE SHAFT

To increase the strength of both side shaft, a solid round rod is machined which gives more rigidity.

#### ROTARY SEAL DESIGN

Developed rotary seal design for better performance and economy.



We have incorporated online sampling valve in the RCVD discharge side cone which enables for the online collection of the product sample without break in the vacuum.





•Rotary Vacuum Paddle Dryer is a cylindrical vessel with a large Diameter Hollow shaft. The Jacket or Limpet Coil provided for heating cylindrical shell. The shaft are attached with hollow paddles provided with specially designed scraper blades, which scrap the entire internal surface of the Dryer and continuously move and rotate the material thereby precluding the possibility of material remaining in contact with hot surface for protracted periods of time.

•The jacket / limpet coil and hollow shaft with paddles can be heated with hot water, steam or any other thermal fluid capable of providing a large indirect heat transfer area. Cooling can be also be done by water, Brine or any other refrigerant through the jacket and hollow shaft.

•Hard facing of shaft provided in way of gland packing areas of trunions. Arrangements for Nitrogen purging provided. Bag cleaning arrangement with pulsation by Nitrogen jet injector provided.

•Heavy duty trunions and bearing support the hollow shaft (agitator) and the drive is provided by means of a motor through reduction gears chain and sprocket.

•In special cases, stationary scraper blade can be provided to scrap the rotating agitator, for highly sticky materials.

## **OPERATION**

•Slurry / Wet cake is charged through the charging door while keeping rotation of the agitator on. Vacuum is then applied to the Dryer along with Dust Catcher (mounted on the Dryer) Condenser and Receiver. Heating medium is passed through the jacket and Agitator. Vigorous evaporation of moisture takes place under vacuum.

•The vapour passes through the Bag Filters of the Dust Catcher, goes into the Condenser and the Condensate is collected in the receiver. Evaporation under high vacuum and low temperature results in faster recovery of maximum solvents. Adequate provision has been provided to cater for fluctuations in steam pressure / temperature, in Condenser cooling water temperature, moisture content of feed etc. •Dry product is discharged via the discharge valve by reversing the Agitator rotational direction to "Discharge" direction.

## SALIENT FEATURES

- •Ideal for Temperature sensitive materials.
- •Improve product quality due to low temperature drying system
- •Almost 100 percent recovery of solvents.
- •Low energy consumption

## **OPERATION CONDITIONS**

- •Vacuum : Up to even 0.6 torr
- •Heating Temperature : 20° to 300°C

## **CAPACITY RANGES**

- •Gross Capacity: From 100 Ltrs. To 25000 Ltrs.
- Charging Capacity: 40 to 60% of Gross Capacity depending on the nature of the products.













#### Note :

Design and selection of the suitable configuration of Rotary Vacuum Dryers for the specific.

Model	Gross Capacity Ltrs.	Charging Capacity Ltrs./m2	Heating Surface Sq. m.	Motor H.P.	Dimensions in mm.							
					A	В	С	D	E	F	G	н
RVD-5	500	200	3.8	7.5	600	1800	4100	4400	6100	2000	1000	3800
RVD-12	1200	480	9.5	10	1000	2000	4300	4700	6700	2500	1500	4200
RVD-16	1600	640	10.5	15	1000	2800	5100	5500	7500	2500	1500	4200
RVD-25	2500	1000	13.6	20	1200	3000	5300	5700	8500	2500	1500	4200
RVD-30	3000	1200	18.4	20	1200	3400	5700	6200	9600	3000	1500	4400
RVD-40	4000	1600	19.5	30	1400	3500	5900	6600	10600	3000	1500	4600
RVD-63	6300	2520	28.1	40	1600	4100	6700	7000	11000	3000	1500	4600
RVD 80	8000	3200	37.2	50	1700	4600	7600	7800	12500	3500	2000	4700
RVD-98	9800	3920	40.0	60	1800	5300	8400	8000	14500	3500	2500	6200
RVD-160	16000	6400	53.1	80	2000	5900	8400	8600	15000	3500	2500	6700
RVD-200	20000	8000	82.0	100	2500	8000	15000	16500	23500	4200	3000	6800



- The Agitated Nutsche filter is a Nutsche type filter designed to separate solids from liquids under controlled conditions. It is totally enclosed and is normally operated under pressure or under vacuum. The remaining little moisture can be removed by evaporation to obtain dry products.
- It consists of a cylindrical shell with welded dished end at the top and either a flanged and bolted dished end or a welded dished end / flat welded end at the bottom depending on process/customer's requirements. The vessel is divided into two compartments by means of a perforated plate, provided with suitable filter cloth or porous tiles. An agitator of unique design is provided inside the vessel. This agitator can perform multifarious activities by manipulating its movement of vertical and rotational directions simultaneously by push buttons switches/PLC.

## **OPERATION**

- Slurry is fed from reactor into the top compartment from where filtrate passes into the lower chamber en route to receiver. Solids are deposited on the filtering media in the top compartment and take the shape of cake of a uniform thickness.
- The agitator pushes the solid content in the slurry upwards by keeping it under suspension till maximum possible filtrate passes through the filter bed. This reduces time and increase productivity. It then seals the cracks in the cake, which develop after most of the filtrate has passed through, by smoothening the top surface of the cake. It also squeezes out some of the moisture in the cake by slightly pressing the cake uniformly with the help of specially designed blades.
- After the initial solvent/mother liquor has been separated, sometimes it is necessary to wash the cake. The Agitator has been designed in such a way that after adding wash liquor on the cake, the entire cake can be re-slurred and agitated, so that all the particles forming the cake can be exposed to wash liquor and be thoroughly washed. This improves the quality of the finished products.
- After washing and removal of wash liquor, the cake can be discharged through a quick opening side discharge valve, by rotating and lowering agitator in the discharge direction. All process control by means of control panel.

### **SALIENT FEATURES:-**

The process works as a completely closed system, eliminating any possibility of atmospheric pollution from toxic fumes / obnoxious smell generated from the slurry.

- 1. Maximum solvent recovery is possible.
- 2. Explosion or fire hazard on account of spillage is eliminated.

3. Less Manpower require. All operations can be handled by a single unskilled person with little training.

4. Very effective washing of cake due to re-slurring resulting in thorough particulate washing and reduces number of washes, and volume of wash liquor.

5. Possibility of doing reaction filtration, washing and distillation in the same equipment. In some cases drying operation can also be carried out in the same equipment. Heat transfer surface can be provided by means of a jacket or limpet coils on the vessel walls. Indirect heating can be provided on the filter base and agitator.

Available in special construction for sterile applications with high standard of particulate purity.



## **MATERIALS OF CONSTRUCTION :**

- 1. Carbon Steel
- 2. Stainless Steel
- 3. Super Stainless Steels
- 4. Hastelloy.

# NOTE :

Sizing, selection of configuration, M.O.C's, methodology of filtration etc. are based on material characteristics.

# **OPTION:**

- 1.) Pressure-Cum-Vacuum filter.
- 2.) Bottom detachable type for ease of cleaning/ cloth fixing.
- 3.) Hydraulic Shaft lift.
- 4.) Hydraulic discharge valve.
- 5.) cGMP Models
- 6.) Filter-Cum- Dryer for drying of wet cakes.
- 7.) Different stirrer designs based on physical characteristics of materials.









MODEL NO.		ANF-0.5	ANF-1	ANF-2	ANF-3	ANF-4	ANF-5	ANF-8	ANF-7
Working Cap.(Ltrs.)		500	1000	2000	3000	4000	5000	6000	7000
Filtering Area (sq.m.)		0.68	1.02	1.82	2.7	3.2	4.7	5.7	6.5
RPM		20	20	20	15	12	12	12	10
Motor H.P.	Rotary	5	5	7.5	7.5	10	12.5	15	15
	Vertical	1	1	1	1	1	1	1	1
Internal dia. (mm)		1000	1200	1600	2000	2200	2600	2800	3000
Over height (mm)		3300	3700	3800	4200	4400	4500	4900	5100



## VACUUM TRAY DRYER:-

• Vacuum Tray dryer is the most commonly used batch dryer. They are box-shaped and loaded and unloaded via a door. Inside are several heating plates mounted one above the other on which the product is placed in trays.

## COMMERCIAL USE

A Vacuum Tray Dryer is widely used in pharmaceutical, chemical and food industries to dry materials that are oxidizable, heat sensitive and hygroscopic in nature. Condenser, heat exchanger and vacuum pump are primary accessories for working of vacuum tray dryer.

## **FEATURES**

- Internal and external both chambers of these Vacuum Tray Dryersare made of high grades stainless steel, with a choice of customer we use S. / SS 304 / SS 316 / SS 316L stainless Steel.
- Doors made of MS / SS 304 / 316 / 316L With thick Layer inter lock & glass wool insulation.
- The bottoms of both heating plates and trays should be as smooth as possible to permit optimal heat transfer between plates and product & minimizing heat loss.
- The medium flowing through the heating plates is water, steam or thermal oil.
- The distance between the heating plates is determined primarily by the surface loading and the foaming of the product.
- To avoid retrograde condensation the cabinet walls are indirectly preheated by the heating plates. The product is introduced and heated at atmospheric pressure, only after all individual product trays reach the same temperature the cabinet is evacuated and drying can start.
- The preheating phase is very important in order that the drying curve and the foaming of the product is identical throughout the cabinet.
- During the main drying phase the vacuum is in the range of 40 to 80 mbar abs and in the final drying phase vacuums of only few mbar abs are reached.
- Heating temperatures are normally in the range between 80C and 110C. Depending on product and surface load, drying takes from a few hours to 1 to 2 days.
- For some products the vacuum and temperature profiles are automatically controlled in order to prevent a pass over of the critical product temperature.
- Vapours produced during drying are taken out direct, or via a steam jet compressor to a surface condenser in which the vapours condensate. The non-condensable vapours are extracted by the vacuum system.
- On completion of the drying, the product can be cooled by circulating of cooling water through the heating plates.

### **SALIENT FEATURES:**

- Especially Designed Locking System is Provided Easy Tighten of the Door.
- Vacuum and Temperature Gauges are provided.
- View Glass is provided on the Receiver to see Condenser Level.
- Limit Switch, Pressure release valve, Vacuum break valve, PID Controller is also provided.



# **OPTIONAL CONFIGRATION:**

- Suitable Size Condenser & Receiver in SS 316/304 to Condensate Collection.
- Circulation pump with FLP Motors and controls
- Vacuum Pump (2stage water ring) consisting FLP motor
- PLC controller
- Nitrogen purging valve
- Validation ports w/ sensors
- IQ / OQ / DQ / PQ Certifications

# Technical Data Sheet of Vacuum Tray Dryer (VTD)

MODEL	VTD 12	VTD 24	VTD 36	VTD 48	-VTD 96
No. Of Trays	12	24	36	48	96
Capacity in Kg	25-35	50-75	75-100	100-150	200-300
Tray volume in <u>Ltrs</u> /Capacity in Kg	10/2-3	10/2-3	10/2-3	10/2-3	10/2-3
Tray size : L W H in mm	812x406x31	812x406x31	812x406x31	812x406x31	812x406x31
No. of Heating Shelfs	7	9	13	17	17
Shelf size in mm	835x835	835x1259	835x1250	835x1250	1250x1650
Distance b/w shelves in mm	100	100	100	100	100
Trays on each self	2	3	3	3	6
Condenser	0.75m2	1m2	1.5m2	2m2	3m2
Receiver	50 Ltrs	75 Ltrs	100 Ltrs	150 Ltrs	250 Ltrs
H.W. Distribution Pipes	1%"	1%"	1%"	1%"	2″
Door Gasket (Silicon)	16mmSQ	16mmSQ	16mmSQ	16mmSQ	16mmSQ
No. of Door Bolts (@40)	8	10	12	12	14



# **CHEMICAL REATORS:-**

We are manufacturing wide range of Reaction Vessel- Reactor for wide variety of chemical reactions including condensation, polymerization, hydrolysis, hydration, reduction, oxidation, hydrogenation etc. for API, Pharma, Biotech and Chemical Industry Standard according to **ASME-Sec-VIII-Div.-1** regulations, with heating / cooling systems.

# **MATERIAL OF CONSTRUCTIONS :**

Various materials of construction, such as MS, SS-304, SS-316/316L, Rubber Lined etc, can be offered as per requirement.

## Salient Features :

- 1. Capacity from 50Ltr.up to the limitation of road transport
- 2. Design range from full vacuum up to 30 Kg / cm<sup>2</sup>
- 3. Design temperature from-20°C to + 250°C.
- 4. Heating / Cooling by double jacket, half coils.
- 5. Agitators available with axial flow, radial or combined double flow
- 6. DQ, IQ and OQ protocols.
- 7. Thermal insulation with stainless tight welder cover (Hot & Cold).
- 8. Agitation systems with mechanical sterile seals as an option.





### HEAT EXCHANGER

NU Pharma is manufacturing shell tube, Finned Tube Heat Exchanger and U-tube heat exchangers according to the international mechanical design codes, using the design software and according to the particular specification of the customer. Part from manufacturing activities, we under take erection, commissioning and servicing of heat exchangers up to the satisfactory performance of the customers



#### PRESSURE VESSLE:-

We are manufacturing pressure vessel as per **ASME** Standard and other international standards. A pressure vessel is a closed container designed to hold gases or liquids at a pressure substantially different

from the ambient pressure.

A common design is a cylinder with end caps called heads. Head shapes are frequently either hemispherical or dished (torispherical).

We are manufacturing pressure vessels and Column for variety of applications in both industry and the private sector.

Volume available from 50 litters up to the limitation of road transportation

Type :- Vertical or Horizontal according to client requirements



# Mfg. & Exporter of

Pharma, Food, Cosmetic Ayurvedic Machinery Bulk Drgs Machinery Plant Consultant Design & Consulting With Turnkey Project



"Success story of Nu Pharma"



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