



RAHUL ENGINEERS



Manufacturing & Delivering
EXCELLENCE



Company
PORTFOLIO

www.rahulengineers.co.in / www.rahulengineers.in

Our Clients



AND MANY MORE...

About Us

We are happy to introduce ourselves as one of the leading value added quality Process Equipments manufacturer, some of them being

- 1 - Spin Flash Drying System
- 2 - Spray Drying System
- 3 - Rotary Vacuum Paddle Dryer
- 4 - Rotary Drying system
- 5 - Drum drying system
- 6 - Agitated Nutche Filter / Cum Dryer
- 7 - Hot Air Generator with possibility of variety of fuels (both direct and indirect heating)
- 8 - Dust Collector for both Boiler and Chemical Process
- 9 - ETP solutions with Zero Discharge possibilities
- 10 - Granulation Plant
- 11 - Falling film Evaporator
- 12 - Distillation Column
- 13- Screw Conveyor System.
- 14 - Pneumatic conveyor System
- 15 - Shell and tube cooler, condenser, heater etc.
- 16 - Autoclaves and Reaction Vessels.
- 17 - Any Custom-built Equipment when full process parameters are given,

if needed equipment's for pilot plant study can be developed.

MOC can be SS, Copper, Chrome-nickel Steel, Chrome-Moly Steel, Inconel, Monel, and Titanium including clad plate material Heat Exchangers can be with Tube-to-Tube sheet Welding, Welding and Light Expansion, only Expansion. Mirror finish up to 220 grit size can be provided wherever needed. We can provide epoxy painting on shot blasted surface to meet Stringent Standard. We are equipped to manufacture equipment's under Third Party Inspection as per approved Quality Assurance Plan. Our welders are qualified and we can take up Equipment's with 100% radiography requirements as per ASME Sec VIII Div 1. We carry out Liquid Penetrate Examination as per ASME Sec V. NDT services like Radiography, Ultrasonic Raw Detection, and Magnetic Particle Inspection can be availed as and when required.



VISION

"To create win win situation for better tomorrow. To atmost satisfy the customer in each & every need. To become global partner for Drying & Filtration"



ASSURED QUALITY

"World class quality Proven to return world class profits"



World Class
Products



After Sales
Services



Value for
Money



Supportive
Staff



SPIN FLASH DRYING SYSTEM

Since our foundation, we have remained committed to offer advanced range of Spin Flash Dryers. Our dryers are mainly used to dry the products which are in paste or cakes form like Intermediates, Dyes, pigments and various types of other products. Manufactured to perfection at our state of art machining facility, these Spin Flash Dryers are best known for their features like negligible maintenance, high operational fluency and long life. Moreover, our clients can avail these dryers from us at a reasonable price.

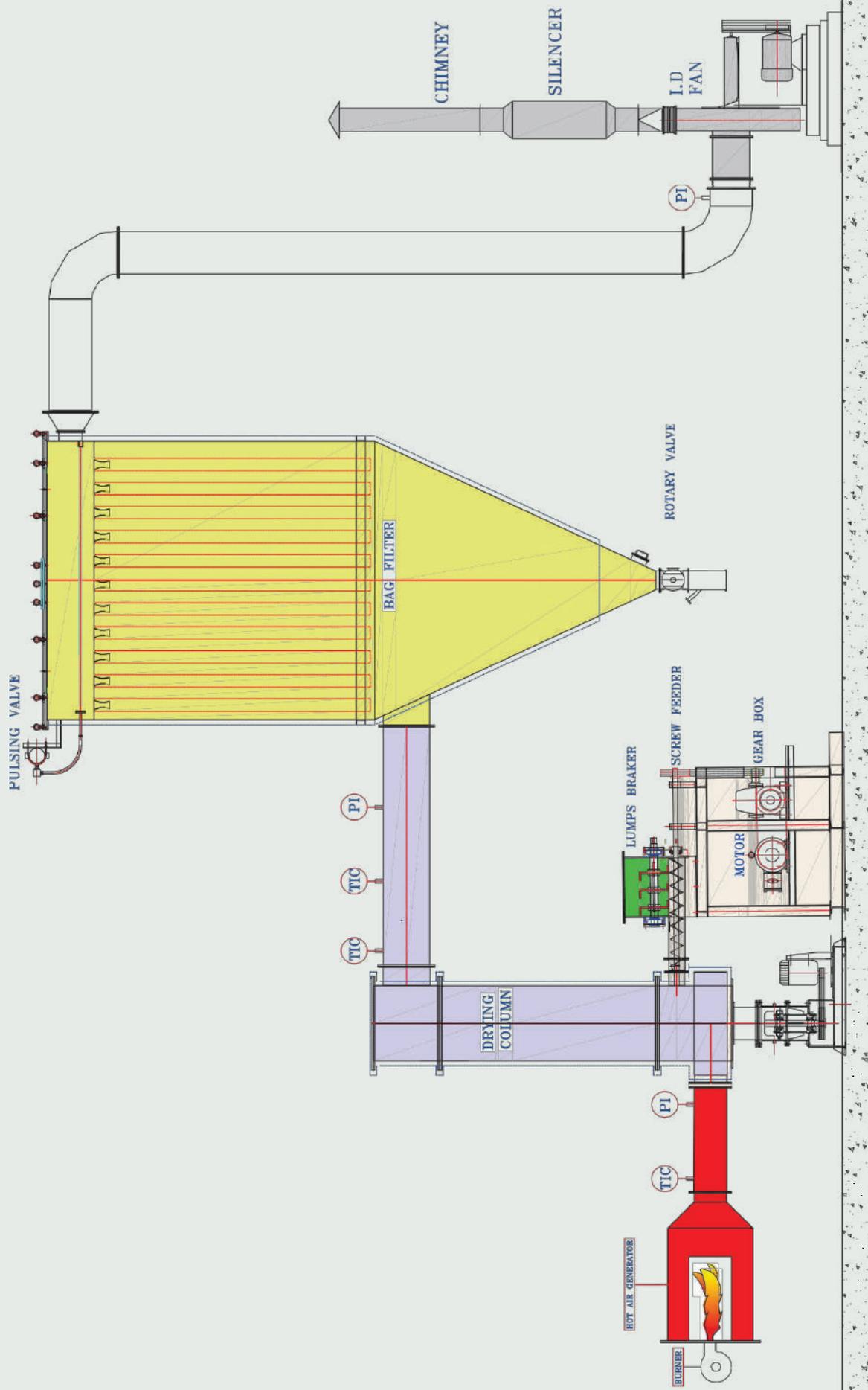
OPERATING INSTRUCTIONS

- Fill up the feeder with wet cake. Feeder should never be overload.
- Set the hot air temperature to SFD as per product suitability. The temperature setting are subject to change depending on site conditions.
- Start the blower motor with damper in fully closed condition.
- Start the agitator cum scrapper motor.
- Start HAG. Let the inlet temperature to SFD and outlet temperature from SFD rise point.
- Feeder motor will start as soon as the outlet temperature of SFD reached the set point.
- Start the Rotary air lock valves & Switch on the sequential timer of Bag filter. When the system gets stabilized, dry powder will be continuously discharged.

SALIENT FEATURES

- An extremely energy efficient continuous drying system, the efficiency being in the region of 70.90 per cent.
- Dust-free operation, because it operates under negative pressure.
- Dries wet cake / pulverizes large particles / classifies particle size.
- Combines the advantages of Flash Drying system and Spray Drying system as far as dispersion of dry product is concerned.
- Occupies lesser space compared to Spray Dryer or Pneumatic Flash Dryer.
- Very wide range of applications as compared to other types of direct contact dryers.

FLOW DIAGRAM OF SPIN FLASH DRYING SYSTEM





SPRAY DRYING SYSTEM

Working of Spray drying system is a one-step continuous unit operation that employs liquid atomization to produce droplets that are dried to individual particles when moved in a hot gaseous drying medium. The three stages that occur in a spray dryer before drying is accomplished include atomization, spray-air mixing, and moisture evaporation, and dry product separation from the exit air. The spray drying process begins with atomization. During atomization, a nozzle or rotary atomizer turns the liquid feed stock into small liquid droplets. This is followed by the separation of the solute or suspension as a solid and the solvent into a vapour. It is during this stage that many of the desired product qualities such as particle size and viscosity are developed. When droplets exit the nozzles or atomizer, they are dried to form a powder that is easily packed and transported. Solids form as moisture quickly leaves the droplets. The solid is usually collected in a drum or cyclone. The nature of the final product depends on the design and operation of the spray dryer and the physicochemical properties of the feed. Drying of the powder is commonly completed using hot air. The final moisture content in the powder is controlled by adjusting the hot air temperature. The recovery process is the last step that takes a few seconds to recover the powder from the exhaust gas within the cyclone.

ROTARY DISC ATOMIZATION

A high speed rotating disc is used for atomizing the liquid feed. The disc throws the liquid outward or tangentially at high velocities forming fine droplets / mist. Instant drying takes place in contact with hot air forming free flowing dry powder.

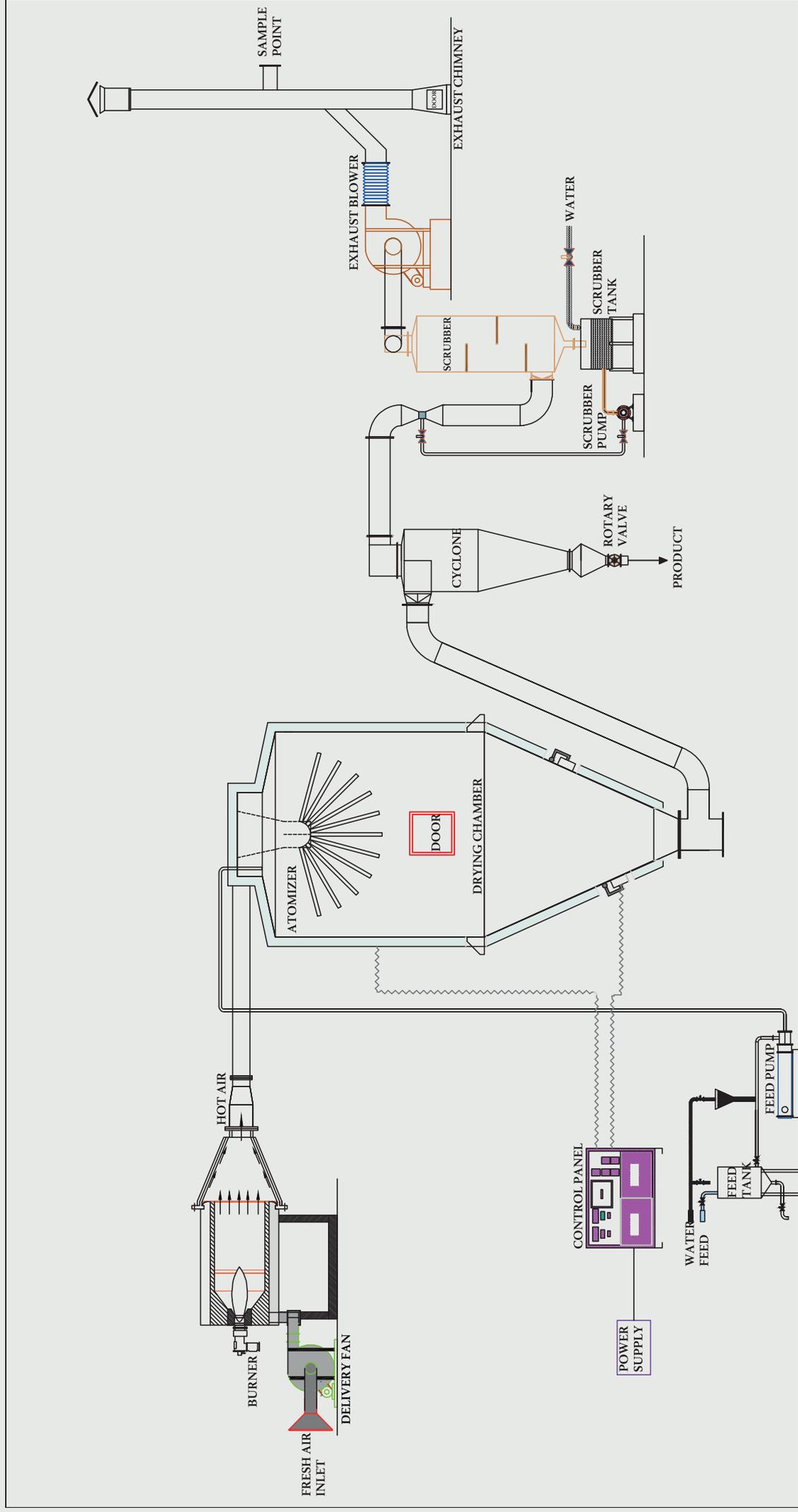
Discs designs include straight / curved vanes, pin wheels, multilayer discs in diameters of 60mm, 100mm, 160mm, 250mm & 350mm for different capacities. For high temperature applications special bearing cooling arrangements are provided.

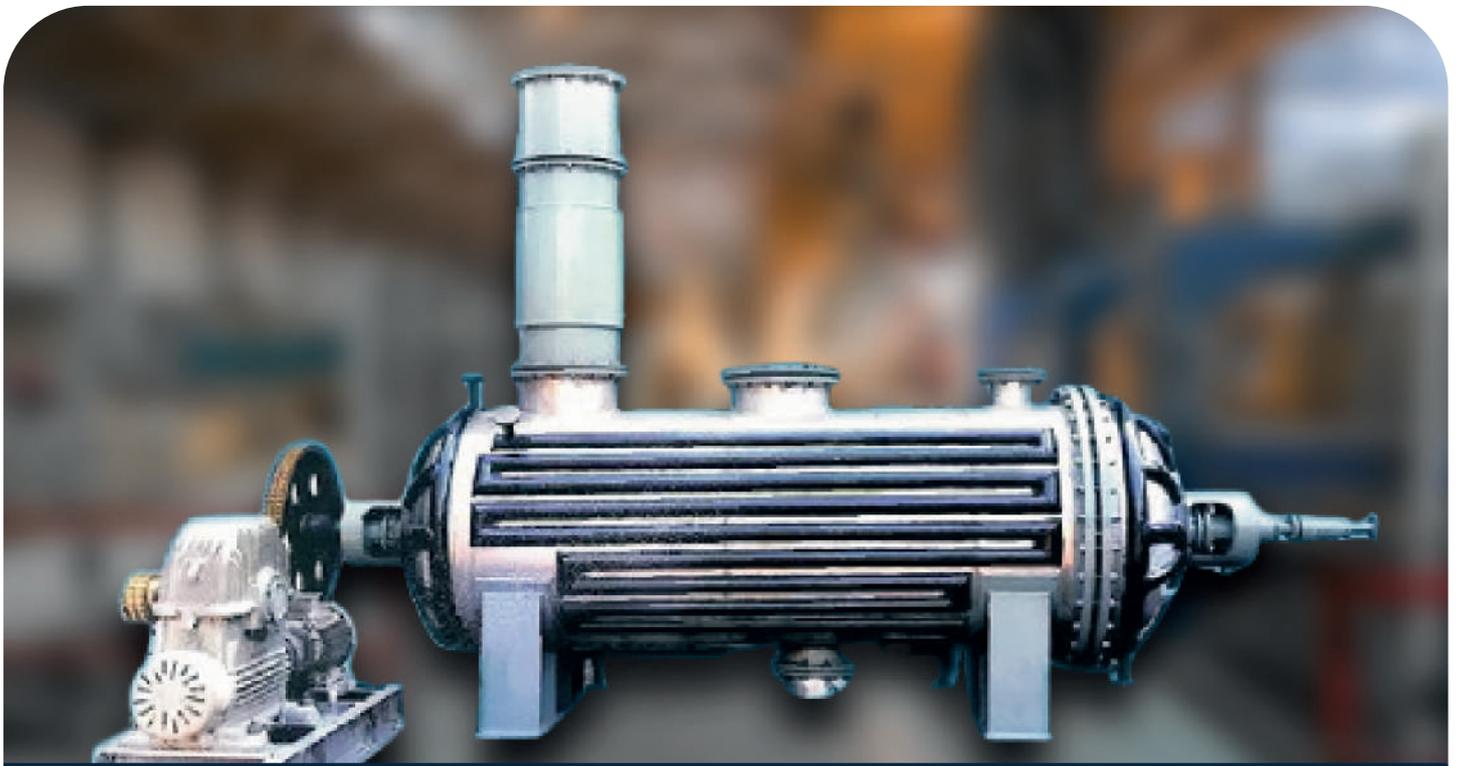


The main advantage of spray drying is its versatility of the technology. Spray drying offers multiple opportunities that no other single drying technology provides. The flexibility and reproducibility of spray dryer makes spray drying the process of choice for many industrial drying operations. It has the following other advantages :

- 1. This technique has the ability to operate in aseptic pharmaceutical processing.*
- 2. Feed rates in spray drying can range from a few pounds per hour to over 100 tons per hour and thus can be designed to any capacity required.*
- 3. The spray drying process is very rapid, with the major portion of evaporation taking place in less than a few seconds.*

FLOW DIAGRAM OF SPRAY DRYING SYSTEM





ROTARY VACCUM PADDLE SYSTEM

Rotary vacuum paddle dryer is a jacketed cylindrical vessel with a large diameter hollow shaft. Attached to the shaft are hollow paddles provided with specially designed scraper 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 surfaces for protracted periods of time. The jacket 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 cold water, brine or any other refrigerant through the jacket and hollow shaft.

Limpet coil can be provided in lieu of jacket. if liquid heating medium is used. Hard facing of shaft provided in way of gland packing areas of trunions. Arrangements for nitrogen purging provided. Bag cleaning arrangements with pulsation by nitrogen jet injector provided.

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

Provision has also been made to insert four breaker bars inside the dryer shell for particle size reduction. In special cases, stationary scraper blade can be provided to scrape the rotating agitator, for highly sticky materials.

OPERATING INSTRUCTIONS

- Slurry wet cake is charged through the charging door while keeping rotation of the agitator on.
- Vacuum is then applied to the drier along with dust catcher (mounted on the dryer) condenser and receiver.
- Heating medium is passed through the jacket and agitator. Vigorous evaporation of moisture take place under vacuum. The vapor passes through the bag filters of the dust catcher, goes into the condenser and the condensate is collected in the receiver.
- Evaporation under AO 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 the reversing the agitator rotational direction to "discharge direction.

SALIENT FEATURES

- Ideal for temperature sensitive materials.
- Almost 100 per cent recovery of solvents.
- Low energy consumption

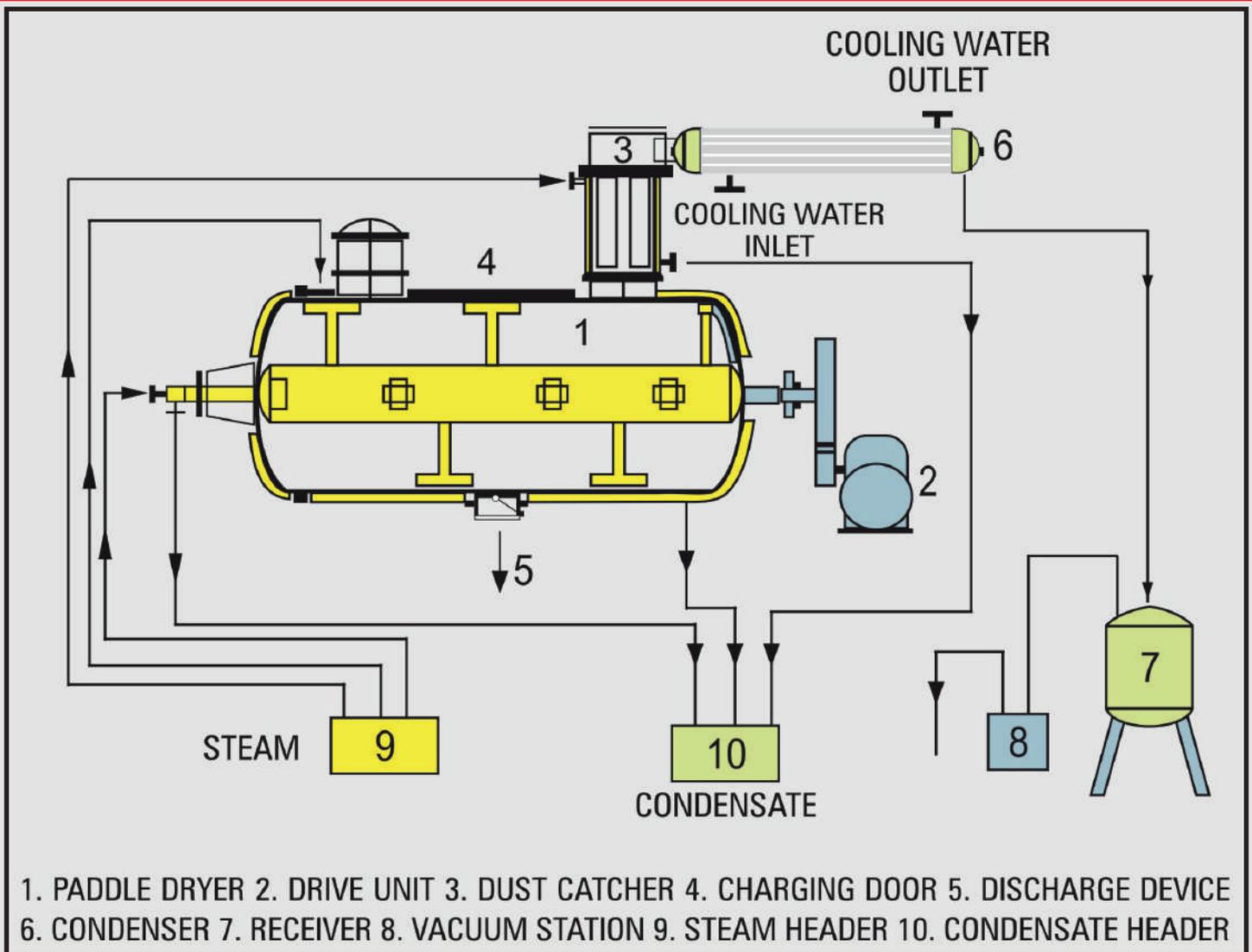
CAPACITY RANGE

- Gross capacity: from 500 Ltrs To 25000 Ltrs.
- Charging capacity: 40 to 60%, of gross capacity depending on the nature of the products.

OPERATING CONDITIONS

Vacuum: up to even 0.6 torr | Heating temperature: 30 to 300 degree Celsius

FLOW DIAGRAM OF ROTARY VACCUM PADDLER SYSTEM



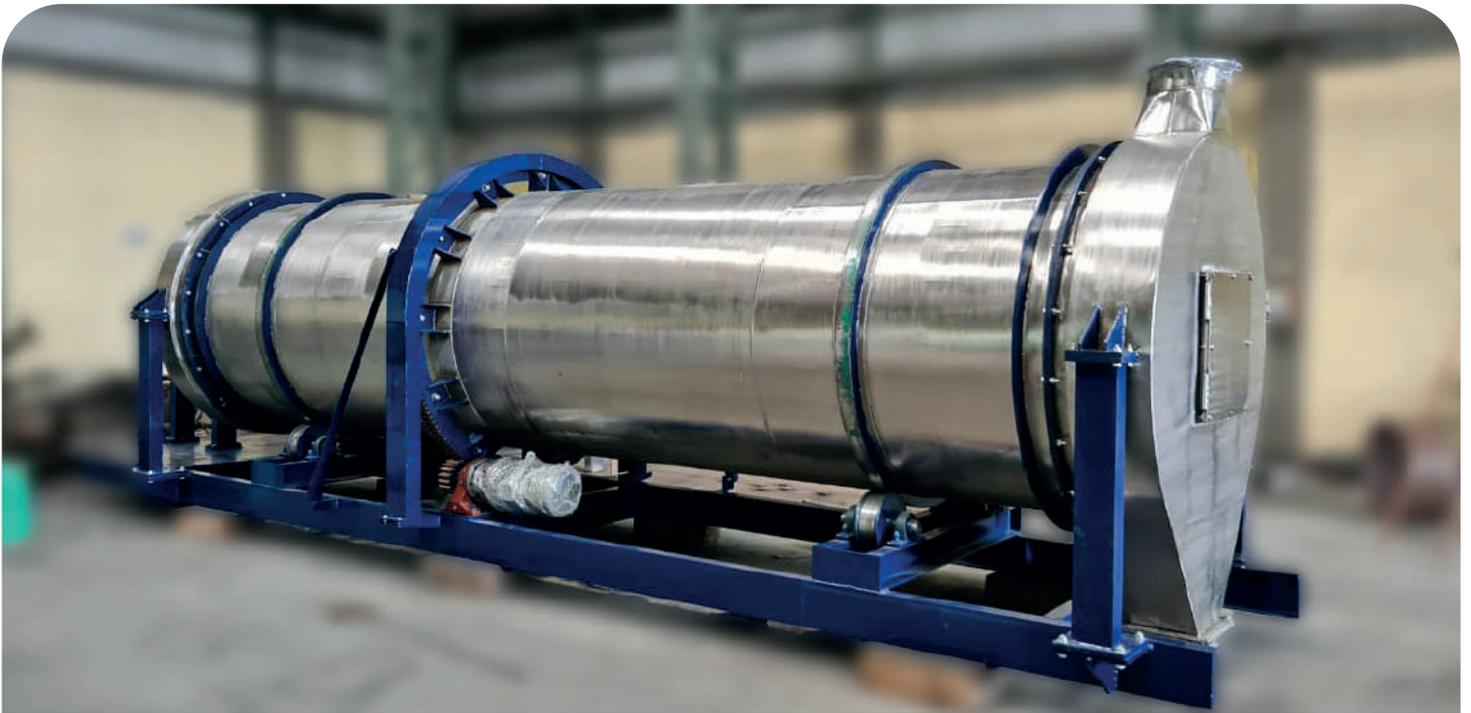
The hollow paddle-type agitator is an important feature of RVPD equipment. It provides efficient mixing and uniform heating of the material. The agitator is driven by a motor and gearbox assembly. The vessel is designed with minimum clearance between the vessel wall and the agitator to achieve maximum heat transfer.

RVPD System Consists Of

- The Main Equipment Comprising of
 - Main Shell with End Covers
 - Limpet or Jacket for Heating and/or Cooling
 - Agitator/Rotor for Mixing and agitation:
 - Bearing Housings with Bearings*
 - Rotor Sealing arrangement*
 - Drive*
- Accessories Comprising of:
 - Discharge valve*
 - Dust Catcher*
 - Power and control Panel*
- Utilities Comprising of:
 - Heating System*
 - Vacuum System with Condenser*
 - Receiver*
 - Vacuum Unit*

Construction Type & Application

- GMP TYPE: API, Pharmaceuticals, Nutraceuticals, Clean Room
- NGMP TYPE - Agro Chemical, Colors, Adhesives, Speciality Chemicals, Pesticides, Insecticides, Etc



ROTARY DRYING SYSTEM

Being a quality focused organization, we are able to provide our valued clients Rotary Dryer, highly skilled workforce processed the offered product by using best quality materials and ungraded methodology in line with the industry laid parameters. These offered dryers are used for drying materials with granularity or humidity in the industries of building material, mineral dressing, metallurgy and chemical. Additionally, our offered products are highly valued by our customers for its quality and long service life features. Apart from this, we are offering these products at very reasonable prices.

Features : Rugged Design/Enhanced Performance/Optimum Performance

Direct & Indirect Type Rotary Dryer:

Direct rotary dryer comprises of rotating inclined shell through which a hot stream of air flows, the wet material present in the rotary shell is lifted by means of spiral flight and showered in hot flowing air. Due to this direct contact, the product is dried.

Direct Rotary Dryer comprises of a rotating inclined shell through which a hot stream of air flows. The wet material present in the rotary shell is lifted by means of spiral flights and showered in hot flowing air. Due to this direct contact, the product is dried. Rotary Dryers are available with co-current or counter current air flow patterns depending on the properties of individual products to be dried.

The internals are designed to ensure uniform distribution over the entire cross section.

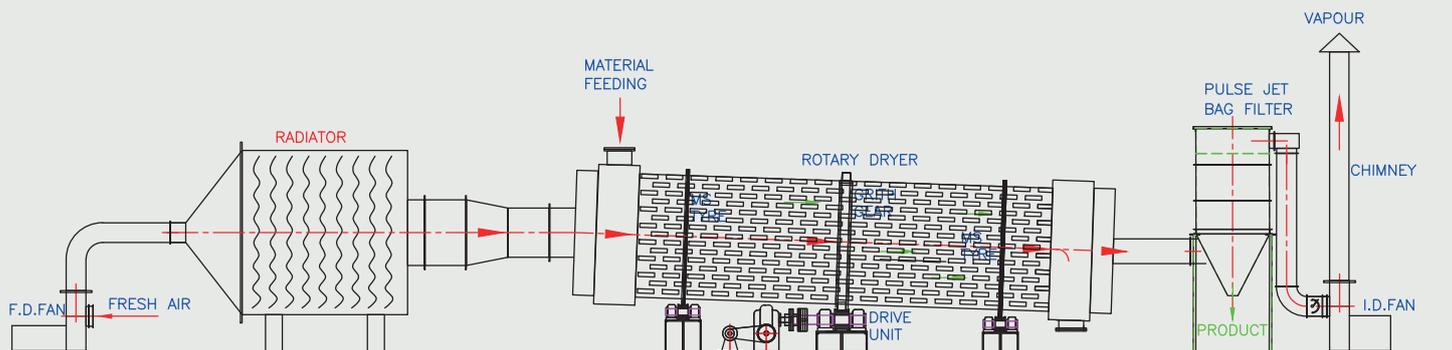
The entire shell is supported on rollers and rotated by means of tyres and girth gear or by means of a friction drive. Sealing arrangement is also provided so as to have a minimum air leakage and product loss.



Direct Rotary Coolers:

Direct Rotary Coolers are used for cooling product to the desired temperature before packing. The product is showered in an air stream by internal lifters. Ambient de-humidified air is used for cooling.

ROTARY DRYER FLOW DIAGRAM



APPLICATION (DIRECT TYPE ROTARY DRYER)

- Chemical fertilizers
- Clay
- Sands
- Limestone
- Ammonium sulfate
- Ammonium chloride

- Waste sludge
- Food products
- Plastics
- Silica sands
- Sugar
- Sodium glutamate

- Nickel ore
- Chemical sludge
- Filter cake
- Ilmenite
- Cryolite
- Ferrous sulfate



- Ideally suited for large capacity application and uneven particle size distribution.
- Continuous operation and versatile application.
- Low operating and maintenance cost.

AGITATOR NUTSCHE FILTER CUM DRYER



ANF/ANFD is an equipment where multi stages of process can be done in single unit without significant handling & shifting in other equipment's. It is a closed vessel with cylindrical shell, Top Dishend & Bottom Flat or Dishend type provided with heavy filter plate & robust stirrer to handle different kind of Liquid-Solid Mixtures. Detachable Bottom can be provided with Power pack system. Legs and castor wheel can be given for easy handling and movement. Guide Pods & Clamping arrangement can be Provided for smooth Seal-Tight Fitting of Lower Portion to Shell with the help of Hydraulic Cylinders.

It is an ideal equipment's for filtration in batches of liquids contains high solid particles where maximum recovery of solid is required. The liquid is separated mechanically using a filter medium and either using a vacuum or pressure or a combination of vacuum and pressure. A good design of agitator improves the quality of filtration and also allows solid to get discharged mechanically.

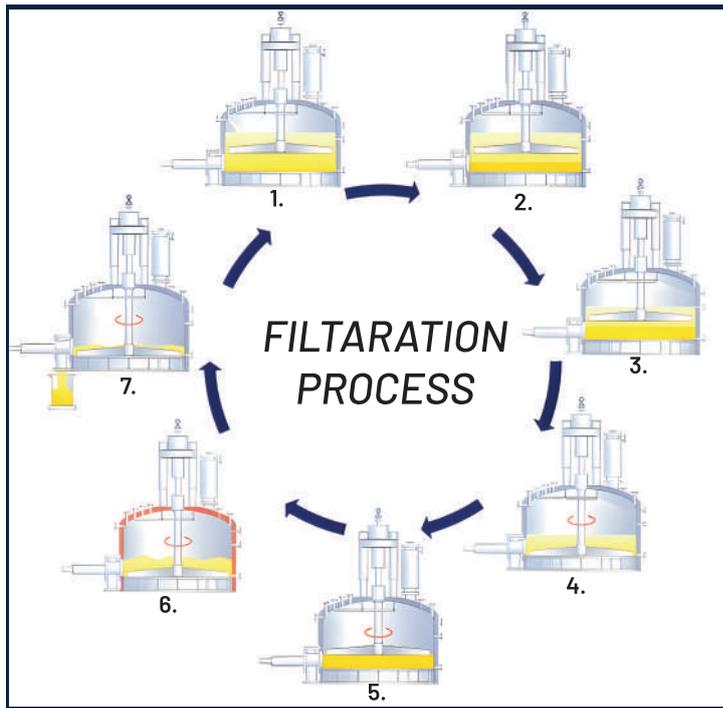


- 1. No possibility of atmospheric pollution from toxic fumes/ obnoxious smell generated from the slurry.*
- 2. Explosion or fire hazard on account of spillage eliminated.*
- 3. Very high solvent recovery is possible.*
- 4. Very effective washing of cake due to re-slurrying resulting in thorough particulate washing and reduced washes and volume of wash liquor*
- 5. Possibility of reaction filtration, washing and distillation in the same equipment and even in some cases drying.*
- 6. Available in special construction for sterile applications with high standard of particulate purity.*

SALIENT FEATURES

- Designed and Manufactured to suit critical hygienic conditions of pharma and food industries. (cGMP MODEL) and also for STERILE Applications.
- Method of operation is totally enclosed, neat and hygienic. These conditions are excellent for solvent recovery, 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.
- The unit is designed with minimum maintenance features.
- Specially designed tank cleaning nozzle is provided for thorough cleaning of inside of filter body (CIP).
- The equipment is functionally safe and easy to operate
- Minimum hold up of filtrate in the equipment
- Agitator moves clockwise, anticlockwise, up and down. This ensures thorough washing and re-slurring of the cake.
- Blending of product possible before discharging • Product can be washed thoroughly and economically with solvents.
- Complet automation with PLC is available
- Combining filtration, washing, re-slurry and drying in one fully enclosed, automated unit permits reduction of capital and operating costs
- Heat transfer surface can be provided on the vessel wall by providing Jacket or Limpet Coil.
- Large quantities can be processed faster than the conventional systems.
- The number of conventional machines is employed for filtration process is also reduced.

FILTRATION PROCESS



01 | Filing

02 | Filtering

03 | Displacement Washing

04 | Reslurry Washing

05 | Smoothing

06 | Drying / Cooling

07 | Discharging

Stage of Process

01

Filteration

02

Washing of Filter Cake

03

Repeat mix or Washing of the Cake

04

Smoothing with compression of the cake

05

Convection Drying of the Cake

06

Fully automatic discharge of the wet or dried cake

MODEL SPECIFICATIONS

MODEL NO.	RE 500	RE 1000	RE 2000	RE 3000	RE 4000	RE 5000	RE 6000	RE 7000
Working Capacity (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
R. P.M.	20	20	20	15	12	12	12	10
Motor- Rotary	5	5	7.5	7.5	10	12.5	15	15
H.P -Vertical	1	1	1	1	1	1	1	1
Internal dia. (mm)	1000	1200	1600	2000	2200	2600	2800	3000
Over height (mm)	3400	3600	3800	4100	4300	4500	4800	5000

Note: The above dimensions are only indicative. Final choice will depend upon the operating parameters required based on material characteristics. Sizes above 7000 litres can also be offered

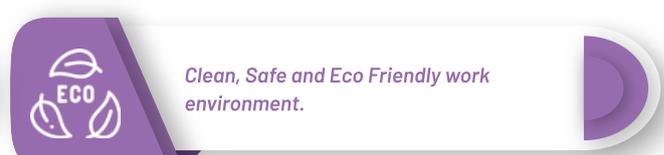
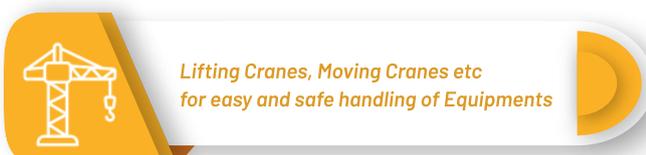
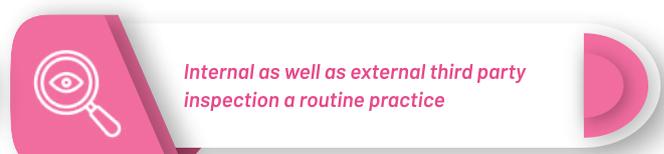
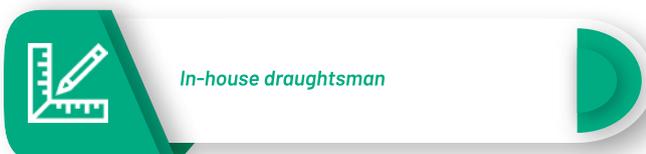
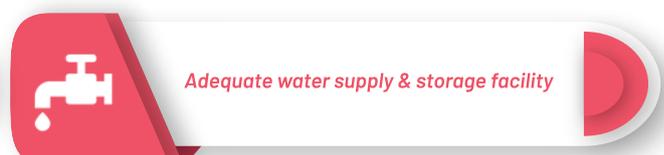
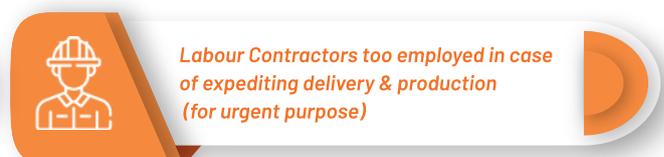
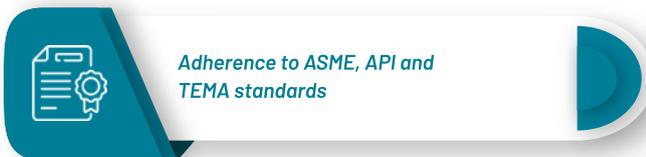


INFRASTRUCTURE

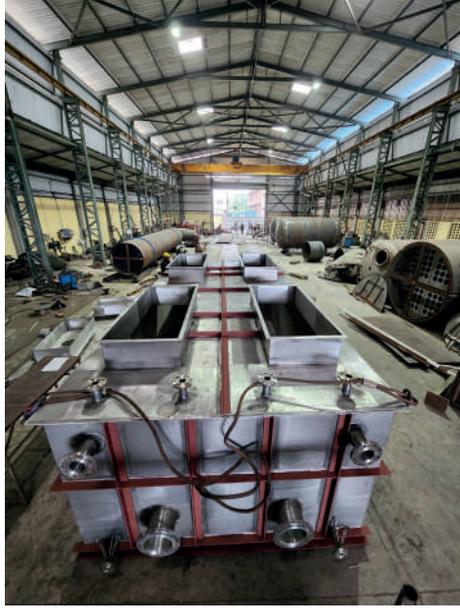
The Manufacturing area is in Dungra GIDC Vapi Gujarat. A fast developing industrial area of Vapi Gujarat

The Manufacturing area is well equipped with adequate Plant & Machinery for the fabrication of process vessels, and good engineering practice is followed

- Welding Inverter
- Water Transfer Pump
- EOT Crane
- Bench Grinder
- Hydro Test Pump
- Hydraulic Bending Machine
- Pipe Cutting Machine
- Rolling Machine
- Key Way Machine
- Drilling Machine
- Polishing Shaft Motor
- Plasma (Plate) Cutting Machine
- Lathe Machine
- Grinder Machine
- Polishing Machine
- Manual & Electric Air Compressor



INFRASTRUCTURE PHOTOS





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