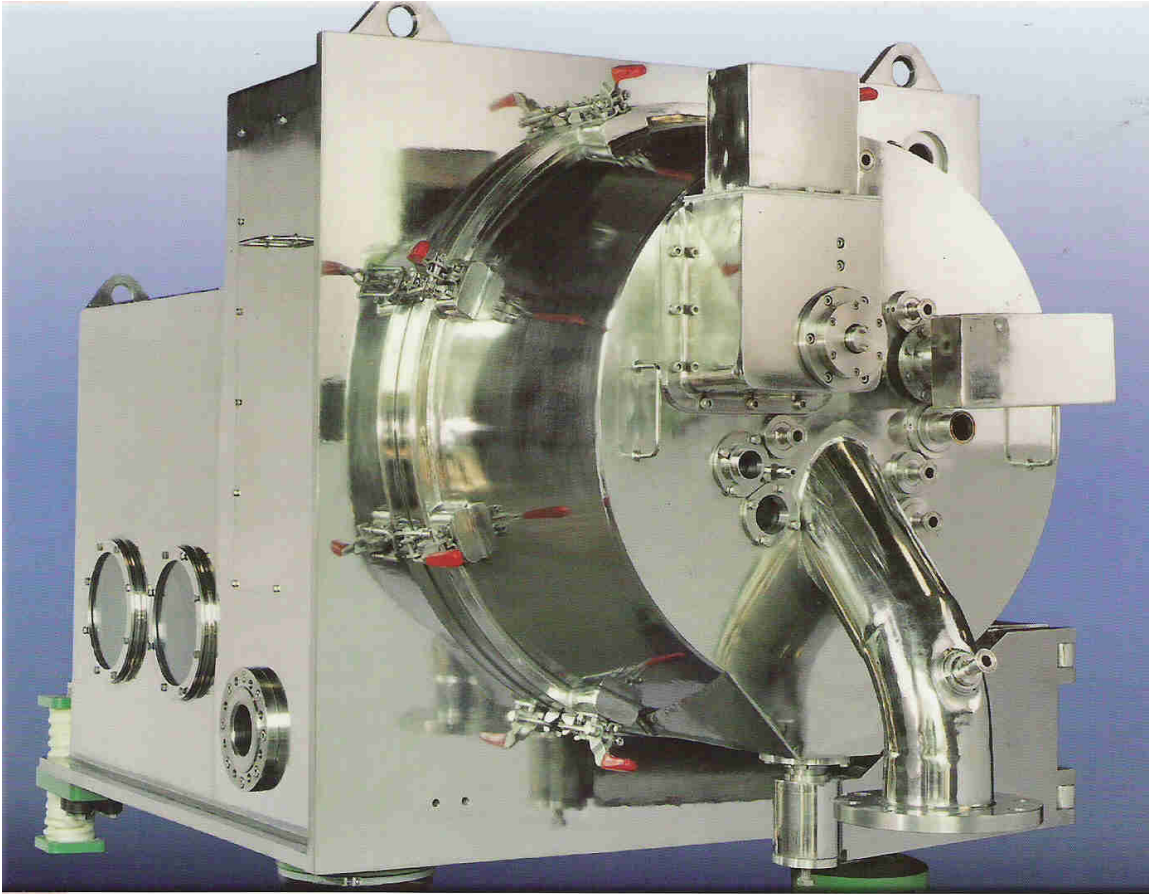


# Horizontal Pharma Peeler Centrifuge



## **Sukhras : At the very center of the Pharma Sector**

To rise on the wings of a rising star,  
To reach the heights of young mountain,  
To attain stillness at the very center...

The vision and aspirations of a company specializing in manufacture of centrifuges.  
As the pharmaceutical field becomes one of the fastest growing sectors, Sukhras gets set  
for heights greater than ever before.

## A look at our past

High value and high quality products, FDA, cGMP, cleaning in place system validation, sterile processing in the clean room atmosphere, backed by flexibility of economics are the needs of the pharma process industry in this millennium.

In this scenario, Sukhras has successfully established itself as one of the leading manufacturers of industrial centrifuges, in the pharmaceutical and chemical industries. To retain this worldwide reputation, the R&D team at Sukhras is constantly working to improve technology. To this end, we have various types of centrifuges and centrifuge systems in the past 35 years. These are among the finest, most reliable and economical machines, always endeavouring to advance the technology.

## Our portfolio

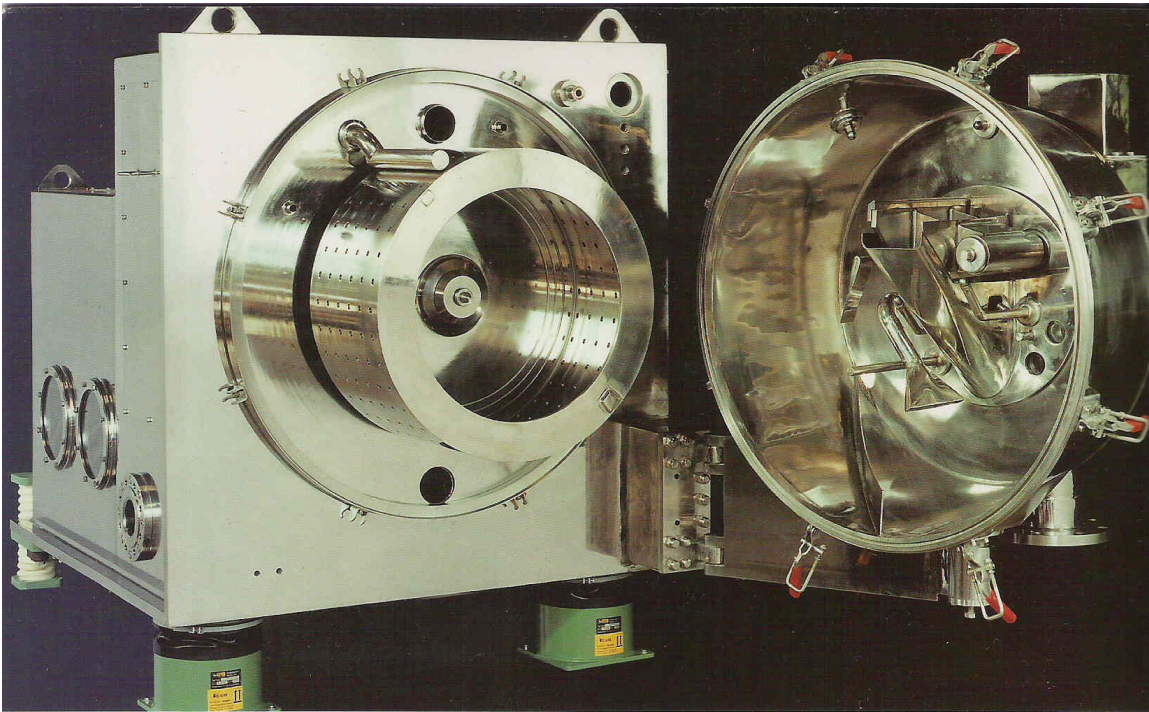
### Pharma Peeler Centrifuge Machines

To help the pharmaceutical process industry keep pace with ever changing demands, Sukhras has introduced the latest range of PHARMA PEELER CENTRIFUGE MACHINES.

### Unique Features

- The combination of filtration and drying operation: As both the operations are performed in separate equipment (Centrifuge and Dryer respectively); the system has a distinct advantage over filtration + Drying Systems.
- High speed rotating machines, classified as HIGH G centrifuges.
- Designed for ease of cleaning and validation with full access to all process wetted parts, assured by a fully openable casing.
- An effective residual heel removing system ensures almost complete removal of the cake after each centrifuging lots.
- The CIP cleaning system ensures effective and faster cleaning of centrifuge internal for product.
- **BASKET:** The centrifuge basket made of solid stainless steel or alloy material, as per the process requirements; is machined to a close tolerance all over and heat treated for stress relieving and better corrosion resistance.
- **CENTRIFUGE MAIN FRAME:** The centrifuge basket, bearing assembly and jacket, is horizontally mounted on a stainless steel main frame.

- **CENTRIFUGE SUSPENSION:** The centrifuge is suspended over four points on vibration isolating spring inputs. The vibration isolating mounts are of maintenance free design, designed with springs and filled with viscous fluid to arrest vibrations. The use of these types of mounts eliminates the need for concrete foundation for centrifuge system. The centrifuge support structure/ floor should be capable of withstanding static load of the system.



- **CENTRIFUGE MONITORING CASING (JACKET):** The basket monitoring case is of conical shape and having full opening design. The process line connection and peeler mechanisms are mounted on the front side of the case. The design and manufacturing of the case is such that there are no dead corners where solids are usually accumulated.
- **BEARING HOUSING ASSEMBLY:** The main shaft is fitted with a combination of cylindrical roller bearing and angular contact ball bearings. The bearings are oil lubricated with oil circulating power station, which continuously circulates the oil throughout the operation of the centrifuging cycle. The bearing is housed in gas tight construction, fitted with specially designed PTFE lip seals.

- **PEELER ASSEMBLY:** The peeler of the centrifuge is actuated by hydraulic cylinder, the peelers shaft assembly, having blade and mounting arrangement; designed and located over the discharge chute, so that scrapped cake directly falls in the chute and gets discharged. The peeler plow assembly and discharge chute have high polished surface, with no dead corners for solid accumulations. The high polish ensures that material is subjected to minimum resistance when being discharged.
- **CHARGE DETECTOR:** Electronic Probe type charge detector is installed on the centrifuge machine to limit the maximum cake thickness. This system ensures the overfilling of the centrifuge basket.
- **CLEANING IN PLACE SYSTEM (CIP):** The centrifuge process area is fitted specially designed CIP nozzles. These nozzles are strategically located to ensure that during the entire process area is cleaned and can be validated. The basket monitoring casing (jacket) is fully openable for cleaning validation purpose, allowing convenient access area. The CIP system and full opening design give greater ease for change of one batch to another of the same product in cGMP and USFD approved manufacturing plants
- **HEEL BLOWBACK SYSTEM:** The centrifuge machine is fitted with rest cake heel blowback system. After each scraping cycle, a residual heel remains on the basket wall, which is not desired in the process. The pneumatic blowback heel removal system consists of a fix tube mounted on the outside of the basket. The gas flow effects a short lifting of the filter cloth, thus the heel cake drops in the discharge chute. This system ensures that there is almost no material left inside the basket after peeler operation.
- **DRIVE AND MOTOR:** The electric motor is employed for the centrifuge operation. The transmission is through belt and pulley. The entire drive system along with motor is installed in the centrifuge drive chamber, which is of gas tight chamber which is of gas tight design. The drive chamber is fitted with special cooling system to cool the motor. The electric motor is controlled by means of AC variable speed drive to vary the basket speed for the different process cycles of the centrifuge machine. The drive is fitted with dynamic brake system for the basket.
- **CYCLIC AUTOMATION:** All the process cycles of the centrifuge operation are automated through Programmable Logic Controller. The instruments mounted on the machine will communicate with the PLC system, ensuring that all the centrifuge processes are performed as per the logic program designed, specific to the process.

- **VIBRATION MONITORING SYSTEM:** The centrifuge is fitted with vibration monitoring system. The system continuously monitors the vibration levels of the centrifuge machine during the entire operation. The output signal from the system is given to PLC system, which will control the centrifuge operation as per the information received.
- **TEMPERATURE MONITORING SYSTEM FOR MAIN BEARINGS:** The centrifuge main bearing housing is fitted with temperature sensors, which continuously measures the temperature rise inside the bearing housing. The system is supplied with temperature indicators and controller, which will communicate with the PLC system.

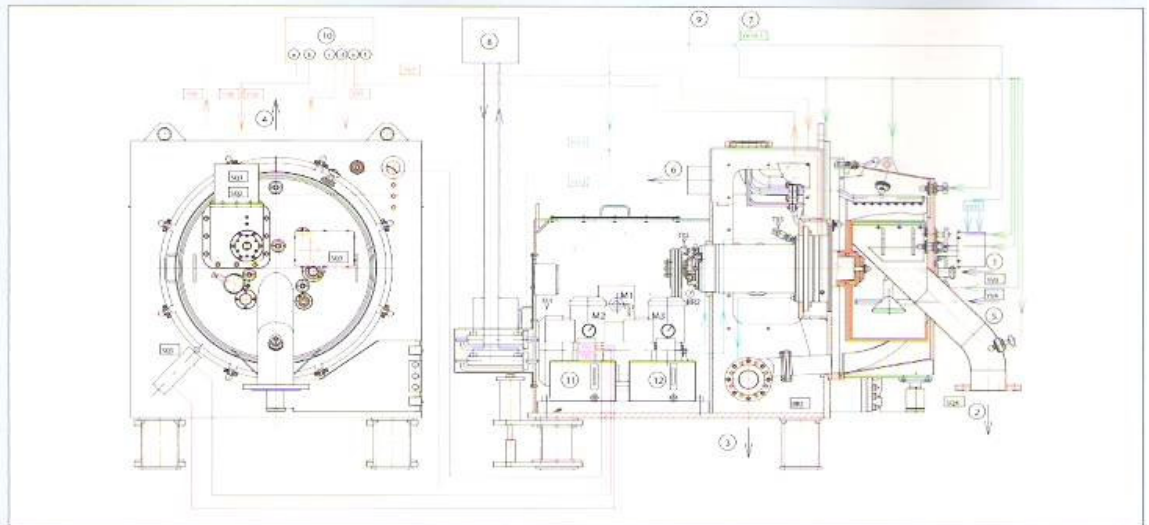


- **DRYER:** The centrifuge system is connected with the conical dryer, the wet cake from the centrifuge machine is dropped directly into the dryer in a totally enclosed condition. This arrangement ensures that there is no product contamination; and manual handling of the product is completely eliminated. The system is ideally suitable for toxic and hygroscopic products, sterile and USFDA approved plants.

- **MAIN PROCESS VESSEL:** The dryer main process vessel is conical in shape, with the inside wall being a polished surface. The outside of the shell is provided with heating the surface. Over this is an insulation jacket for heating the surface. Over this is an insulation jacket that ensures that the heat transfer is only in one direction, i.e. only on main shell.
- **DRYER TOP COVER:** The dryer top cover is hinged type openable cover and provided with insulation jacket. The cover is provided with light and sight glass flanges, Product input (Feed) nozzle having flanged connection, vacuum filter assembly and pad flange for bearing housing agitator assembly. The inside of the cover is polished, suitable for cGMP standards. The cover is provided with the hinge plates and pin with counter balance spring unit for the ease of opening manually, without any mechanized device.
- **AGITATOR & BEARING HOUSING ASSEMBLY:** Dryer is provided with an agitator assembly consisting of shaft and spiral blades. The spiral blades are provided throughout the process area of the dryer. The spiral blades are so designed that during rotation it has a minimum clearance between the blades and vessel wall. The rotational action of the agitator picks up wet powder from center and splashes on the sidewall of the vessel, which is heated by the heating media. In this manner, the product is dried. The shaft is supported by taper roller sealed bearings. The shaft entry inside the dryer vessel is provided with cartridge type mechanical seal assembly for leak proof sealing.
- **FILTER ASSEMBLY:** Filter assembly is provided on top of the dryer cover. During drying operation, vacuum is applied inside the vessel through this assembly. The vacuum assembly is provided with specially designed filter bag holding cage, so that, when vacuum is applied the dried particulate do enter in to vacuum stream and product loss is completely avoided. The bag assembly is a quick openable design, thus after every batch the filter bag can be replaced or removed for cleaning purpose. In this manner, it fulfils the cGMP and USFDA requirements of batch contamination of mix up.
- **DRIVE:** The dryer agitator assembly is driven by electric motor, directly mounted on the top of the shaft. The motor is driven by AC inverter variable speed drive to vary the speed of the agitator as per the process requirements.
- **PRODUCT OUT-PUT FLANGE & OTHER ASSEMBLIES:** The dryer bottom flange is provided with product out-put flange to fix product discharge valve. The valve can be fitted between flanges. The out-put flange is provided with nitrogen purge nozzles to flush the dried product after discharge.

- **SEALS AND GASKETS:** All the process contact gaskets and 'O' rings for the centrifuge and dryer are PTFE encapsulated viton or silicon rubber to give longer sealing life. Also, these ensure zero- contamination, as PTFE withstands almost all material and higher temperatures.





### DETAILS OF LEGENDS

- |                             |   |                                      |                               |
|-----------------------------|---|--------------------------------------|-------------------------------|
| 1. Product Filling          | a. Vapours Output                             | YV6 Nitrogen Output                  | SQ5 Jacket Closing Sensor     |
| 2. Product Output           | b. Blowing of Remainder                       | YV7 Inertization of Stuffing Box     | TX1 Air Thermometer           |
| 3. Outlet Liquid            | c. Measuring of N2 Atmosphere (Not Connected) | YV8 Blowing Over Pressure            | TS1 Motor Overheat Sensor     |
| 4. Vapours Output           | d. Nitrogen Input                             | YV9 Remainder Blowing                | TX2 Rear Bearing Thermometer  |
| 5. Covering Liquid          | e. Output of Stuffing Box                     | YV10 CIP Washing                     | TX3 Front Bearing Thermometer |
| 6. Ventilation              | f. Inertization of Stuffing Box               | YV11 Overfilling Sensor              | BX1 Unbalancing Sensor        |
| 7. Rinsing Liquid           | YV1 Control of Hydraulic Lock                 | YV12 Cooling 1 <sup>st</sup> Circuit | BR2 Speed Sensor              |
| 8. Cooling Water            | YV2 Control of Unloader                       | YV13 Cooling 2 <sup>nd</sup> Circuit | M1 Motor                      |
| 9. Pressured Air 0.6 MPa    | YV3 Filling Product                           | SQ1 Unloader Home                    | M2 Hydraulic Station Motor    |
| 10. Nitrogen - Inertization | YV4 Washing                                   | SQ2 Unloader Work                    | M3 Oiling Station Motor       |
| 11. Hydraulic Oil           | YV5 Nitrogen Input                            | SQ3 Filing Sensor                    |                               |
| 12. Bearings Oiling         |   | SQ4 Output Valve Position            |                               |

### TECHNICAL DATA

CENTRIFUGE TYPE		SHP 630/160	SHP 630	SHP 800	SHP 1000
Basket Diameter	mm	630	630	800	1000
Basket Depth	mm	160	320	400	500
Volume	l	20	40	80	170
Max. Load	kg	25	50	100	215
Max. Rotation Speed	rpm	2400	2400	1900	1500
Max. Centrifugal Acceleration	g	2000	2000	1600	1250
Motor Performance	kW	7.5	11	18.5	30
Net Weight	kg	2300	2500	4400	7500
DRYER TYPE		SVD 40	SVD 80	SVD 160	SVD 320
Useful Volume	l	40	80	160	320
Total Volume	l	70	140	290	530
Heated Surface	m <sup>2</sup>	0.5	0.8	1.3	1.9
Max. Rotation Speed	rpm	7-63	5-50	4-40	3-32
Motor Performance	kW	1.1	1.5	2.2	4
Net Weight	kg	210	380	690	1250

### NOTE:

1. Values indicated are approximate and may vary on actual machines.
2. The Centrifuge force relates to the basket diameter and maximum speed.
3. Basket load in kgs. will vary based on Bulk Density of the material.
4. We reserve the rights to alter size, weight and design features.



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