

SUPER-D-CANTER

Continuous Solid-Bowl Centrifuge



- Classification of Solids
 - Clarification of Liquids
 - Concentration of Solids
 - Dewatering of Solids



 **PENWALT**

PENNWALT SUPER-D-CANTER

An Innovation In Centrifugal Design

The Pennwalt Super-D-Canter is a specially developed Solid-bowl centrifuge for effective separation of slurries into liquid and solid phases. More than 40 years of designing and application experience alongwith continuous R & D efforts have made the Pennwalt Super-D-Canter the super performer in solid-liquid separation. The superiority of Pennwalt Super-D-Canter is determined by the following factors.

- 1. High Efficiency:** Super-D-Canter operates on the centrifugal sedimentation process. The high sedimenting efficiency and torque capability enables the Super-D-Canter to absorb feed variations more effectively than other types of centrifuge or separation equipment.
- 2. Continuous Operation:** The Super-D-Canter adds to improved production by its continuous operation. Lesser controls and minimum supervision are required. Can replace batch filters, continuous filters and static sedimentation equipment for solid/liquid separation.

- 3. Flexibility in Design:** With a proper selection of design parameters the Pennwalt Super-D-Canter becomes an extremely flexible separation tool with application areas involving:

- clarification of liquids,
- classification of solids,
- concentration/thickening of solids, and
- dewatering of solids.

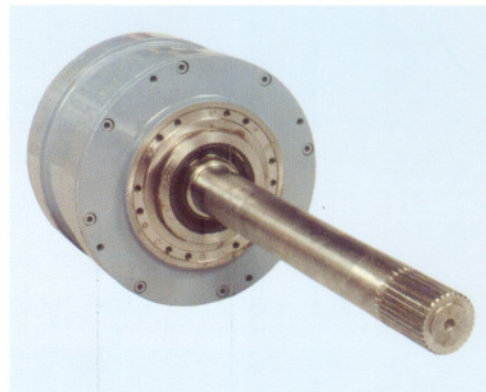
The Super-D-Canter can handle a wide range of solid particles from 6 mm dia. to a few microns and a slurry concentration varying from 0.5% to 65% w/w.

- 4. Economical Operation:** In comparison with conventional solid-liquid separation methods, the Super-D-Canter has minimum power consumption with generally one motor. Savings in energy, space, manpower and maintenance costs, make Super-D-Canter an economic, cost-effective and trouble free equipment in your plant. In effluent sludge dewatering, the Super-D-Canter can mitigate or totally eliminate expensive pre-conditioning of feed.

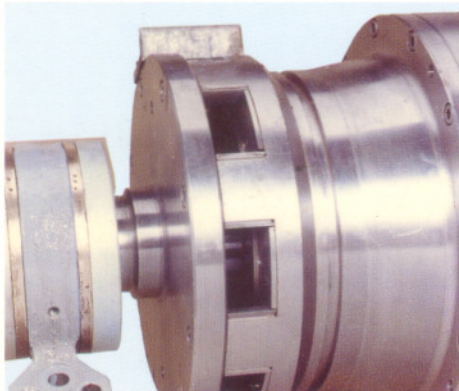
CONSTRUCTION OF A SUPER-D-CANTER



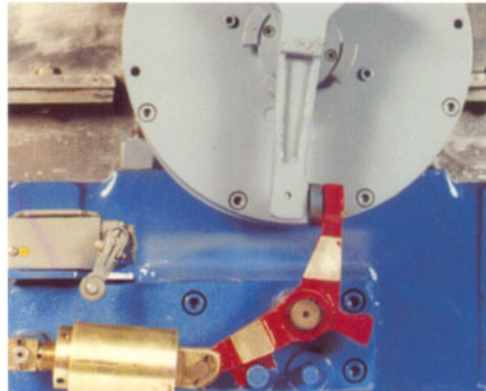
Stressed rotating components are precision machined from centrifugally cast stainless steel.



High strength, high capacity epicyclic gearbox designed exclusively for Pennwalt Super-D-Canter.

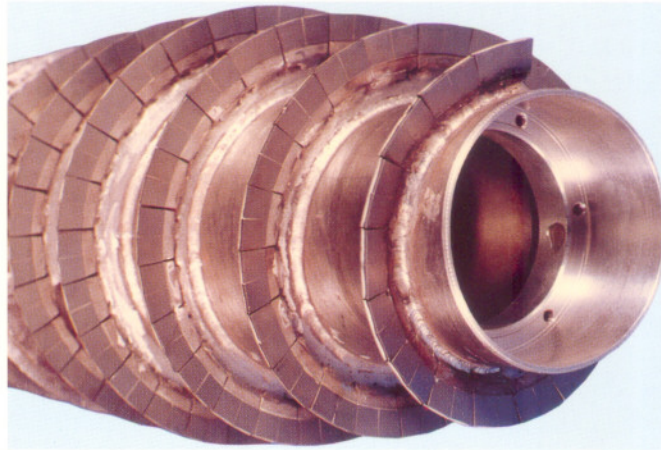


360° solids discharge giving unrestricted solids exit coupled with high capacity, fully abrasion protected using sintered tungsten carbide shields.

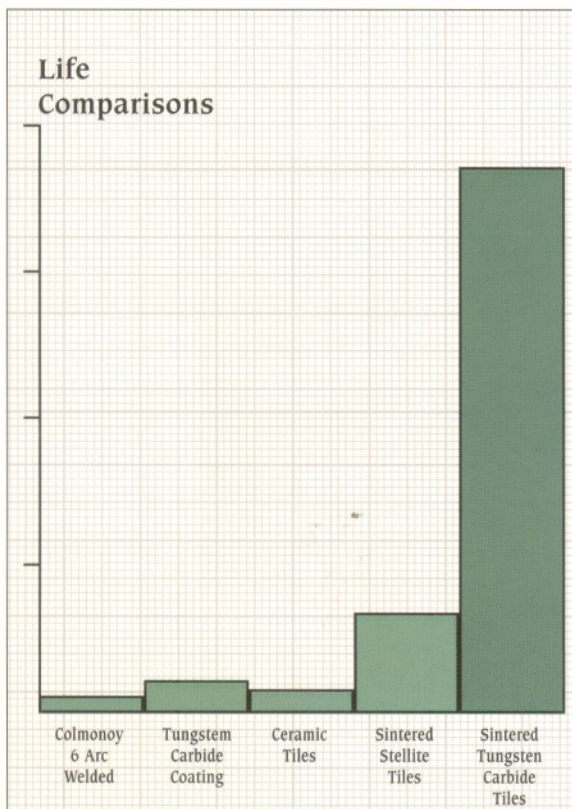
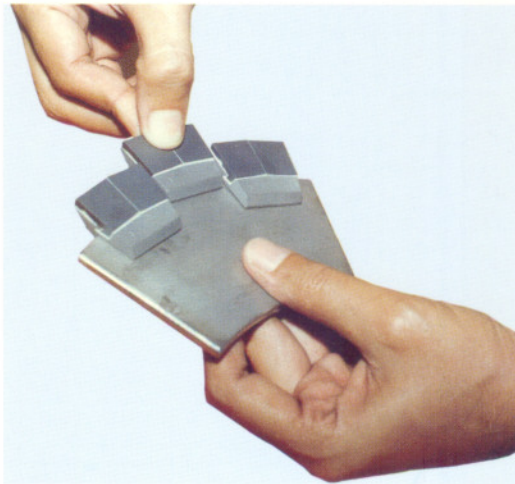


Gearbox overload protection either by clutch or torque arm. Easily reset without the need for shear pins.

PROTECTION AGAINST WEAR



Super-D-Canter scroll showing the tungsten carbide tiles in position.



All wear-prone areas of the centrifuge-feed zone, solids discharge, bowl and scroll are protected by hard surfacing. The type of material chosen are to combat the severity of the wear. While composite hard surfacing materials like stellite are satisfactory for low and medium abrasive duties, the life of the scroll may be as low as 1000 hours on more arduous materials. It was for such applications that Pennwalt developed a protection system using sintered tungsten carbide tiles.

A major advantage of the Pennwalt system of wear protection is that should any tiles become damaged, upto 20 of them can be replaced, in the field, by a reasonably skilled welder without the need for rebalancing.

The Pennwalt tungsten carbide tiling system has enabled Super-D-Canter centrifuges to operate trouble-free on abrasive duties which had not previously been possible. Sintered tungsten carbide is upto 50 times more resistant to wear than flame applied hard facing material. Of greater significance is the comparison with most alumina ceramics which have a low abrasion resistance rating.

STAINLESS STEEL CONSTRUCTION

Ease of maintenance and minimum downtime are important criteria when evaluating centrifuges. We insist on using stainless steel for process contact parts for one reason : carbon steel corrodes. Corrosion leads to product contamination, unbalance, high maintenance and long downtime.

The stressed rotating assemblies and principal elements of the Super-D-Canter centrifuge are machined from centrifugally cast stainless steel. This method of manufacture provides a homogeneous casting of uniform grain structure free from flaws, defects and most important of all, a finished component free from welds.

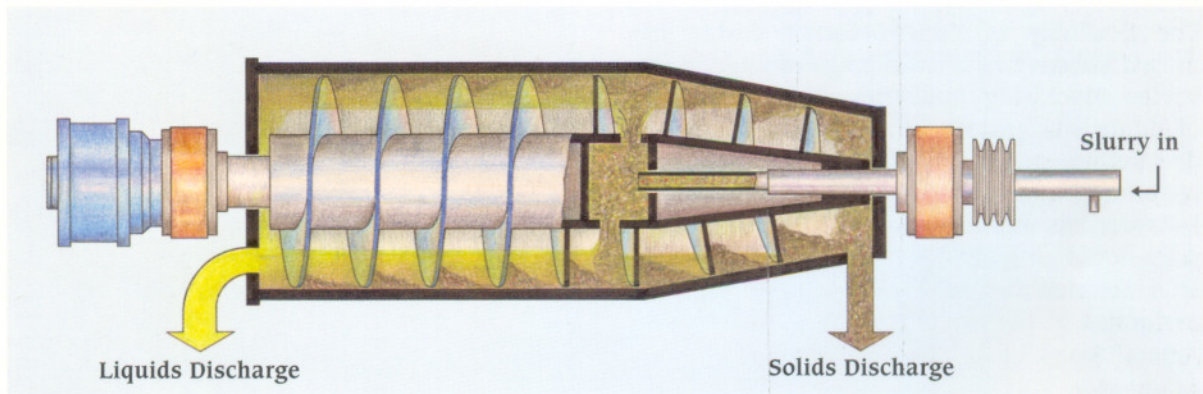


Carbon steel centrifuge bowl after 1 year of operation.



Stainless steel centrifuge bowl after 7 years of continuous operation.

CONTINUOUS OPERATION



Solids are continuously separated from the liquid phase by the application of centrifugal force, ranging to well beyond 3000 times the force of gravity.

The denser solid particles are sedimented against the rotating bowl wall. The less dense liquid phase forms a concentric inner layer. Adjustable dam plates enable the depth of liquid or 'pond' to be varied. The sedimented solid particles are continuously removed from the bowl by the action of the helical screw conveyor

or scroll. The scroll rotates at a lower speed than the bowl, the differential speed being determined primarily by the centrifuge gear box. The solids are 'ploughed' out of the 'pond' and up the conical 'beach'. The centrifugal force compacts the solids and expels surplus liquor. Dewatered solids discharge over the 360° lip of the bowl. Clarified liquid overflows the dam plates situated at the opposite end of the bowl. Baffles within the centrifuge casing direct the separated phases and prevent cross-contamination.

SUPER PERFORMANCE

Four crucial factors govern the performance of decanter centrifuges.

- centrifugal force required to sediment the solids
- clarification of the liquid phase
- differential speed required, between the bowl and scroll, to convey the solids
- hydrodynamic design to minimise turbulence.

In specifying a Super-D-Canter centrifuge, for a particular application, Pennwalt considers other design features including:—

- the pitch of the conveyor
- feed zone design
- beach angle
- bowl surface
- abrasion resistance
- materials of construction
- sedimentation enhancing features.

The correct combination of such features ensures the desired performance at minimum cost.

Operation at High 'G' force is an inherent design feature of the Pennwalt Super-D-Canter and provides flexibility to the end-user. The centrifuge can be operated at the optimum speed, low, intermediate or high without the constraints of mechanical design, to suit the particular application.

APPLYING THE SUPER-D-CANTER

The flexibility of Super-D-Canter design has proved effective in a wide range of applications in the Processing Industries. From separation of dilute suspensions of low solids content to dewatering and concentrating thick slurries containing large quantities of solids, the Super-D-Canter has attained a superior position in the solid-liquid separation technology. Following is a selected list of applications successfully performed by the Pennwalt Super-D-Canter.

Animal Blood
Antibiotics
Brewers Grains
Calcium Carbonate
Calcium Sulphate
Cannery Effluent
Chemical Intermediates
Coal Tailing
Cutting Oils
Distillery Stillage
DMT
Drilling Mud
Dyestuffs
Electroplating Solutions
Enzymes Harvesting

Ethanol Stillage Dewatering
Fine Chemicals
Fish Liquors
Food Processing Effluents
Fruit Juices and Pulp
Industrial Effluents
Inedible Tallow
Instant Tea
Insulin Tissue Separation
Lactose
Municipal Sewage
Nuclear Effluents, Petrochemicals
Pharmaceuticals
Pigments
Polymers
Polystyrene
PTA
PVC Dewatering
Refinery Effluent
Slop Oil Pretreatment
Sodium Sulphate
Synthetic Fibres
Titanium Dioxide
Vegetable Oils

PILOT PLANT TESTING

As part of Pennwalt's continuous Research & Development, a full scale Pilot Plant unit is available for conducting pre-selection trials with your product. The Pennwalt R & D team is willing to try your particular application

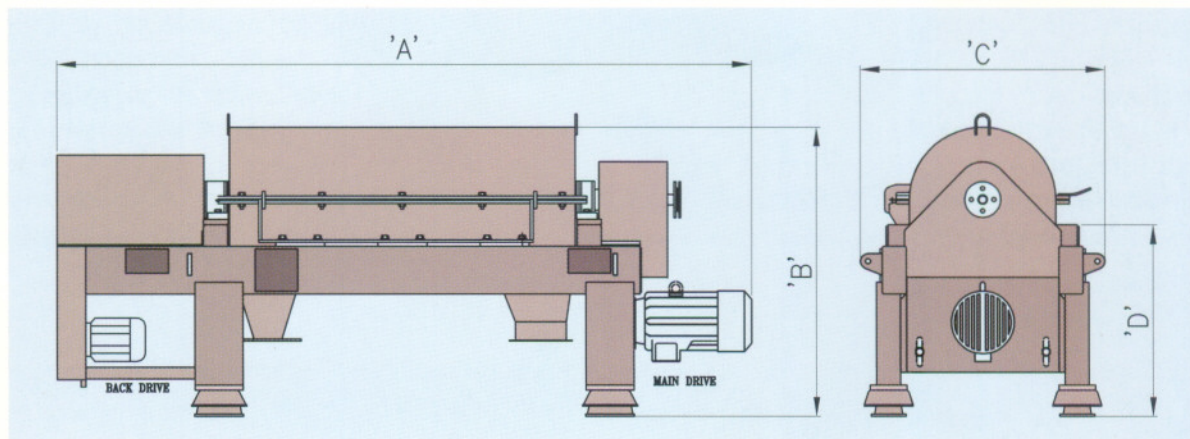


on a pilot scale before recommending the most appropriate separation Equipment for your specific application and capacity requirements.

STERILE CONSTRUCTION

For particular applications in the Pharmaceutical and Food Industries, the Pennwalt Super-D-Canter can be made with 'sterile' features. A 'self-cleaning' facility for thorough periodic cleaning without opening the Equipment can be provided.

GENERAL SPECIFICATIONS



Model	Max. Gravity	R.P.M.	Max. Drive Power (H.P.)		Overall Dimensions (In M.M.)				Net Wt. (Kg.)
			MAIN	BACK	A	B	C	D	
P-600	3070	5000/6000	5	1	1510	742	593	488	230
P-600	3070	5000/6000	7.5	2/3	1665	800	650	590	250
P-1500	3180	4800	10	2/3	1965	1000	800	625	410
	2100	3880							
P-2000	3180	4000	20	3	2150	1211	1018	802	1160
P-3000	3180	4000	20/30	5/10	2362	1211	1018	802	1297
PM-20000	2100	3150							
P-3400	3180	4000	30/40	5/10	2923	1211	1018	802	1842
PM-30000	2100	3150							
PM-35000	2500	3150	40	5/10	2923	1211	1018	802	2230
PM-36000	2500	3150	40/50	5/10	3641	1296	1125	851	2820

Note: The dimensions given above are approximate. In our continuous efforts in updating technology, we reserve the right to change specification without prior notice.

Manufactured based on the technology acquired from

SHARPLES STOKES DIVISION, PENNWALT CORPORATION, U.S.A.

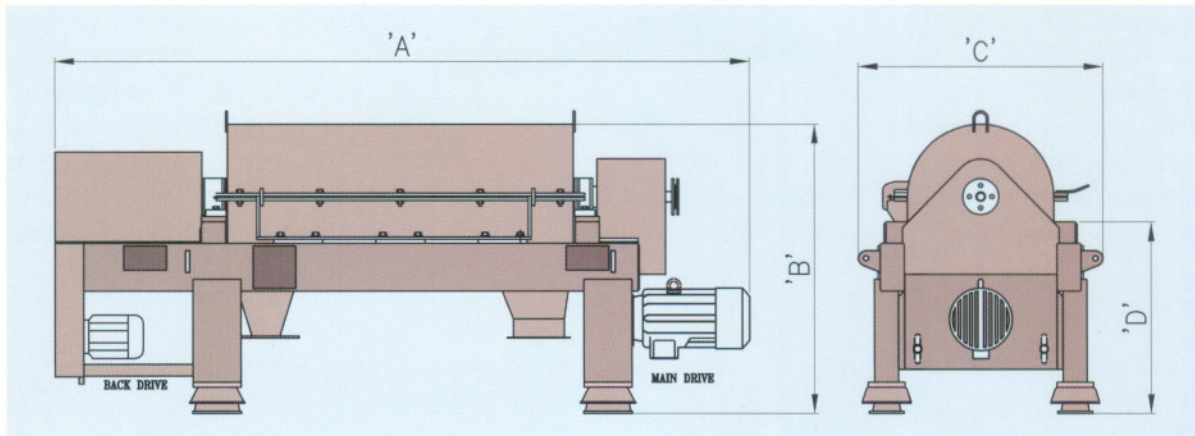


Manufacturing and Research & Development Centre, Navi Mumbai

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