

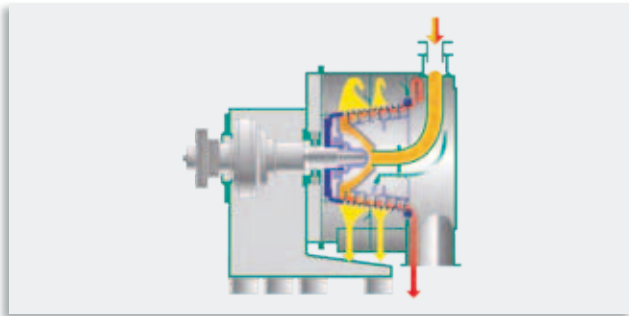
# Centrifuges



Delivery Program

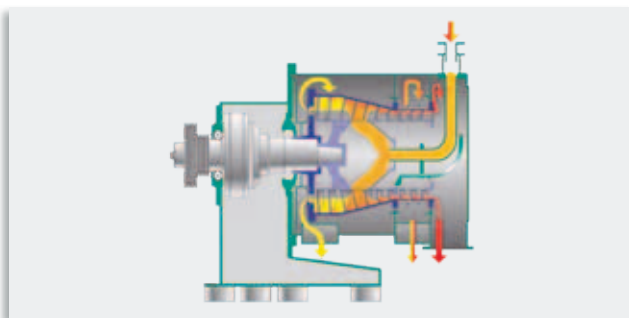
# SIEBTECHNIK centrifuges

for continuous mechanical separation of solids from liquids



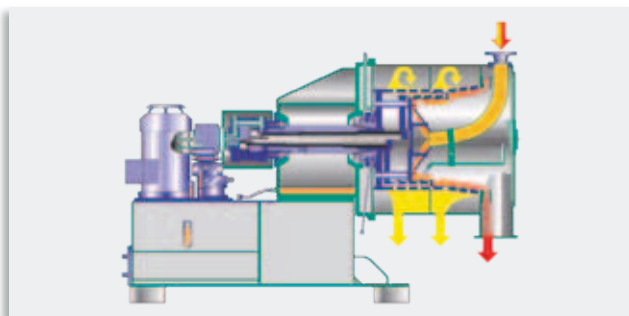
## **CONTURBEX screen worm centrifuge**

The most versatile of our continuously operating filtration machines are our screen worm centrifuges. The solids retained by the screening media are conveyed by the drum inclination and by a worm with slightly different rotational speed from the small to the large diameter. The feed particle size of the solids to be separated is ideally greater than 80 µm.



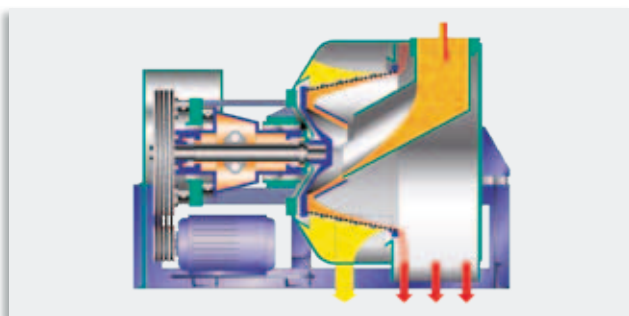
## **CONTHICK screen worm centrifuge**

The design of this centrifuge is based on the technology of our CONTURBEX screen worm centrifuge. This machine also contains a solid bowl pre-thickening area that provides high efficiency separation even at low concentration suspensions. Because of this, the CONTHICK can be used for fine solids with high capture of fine particles.



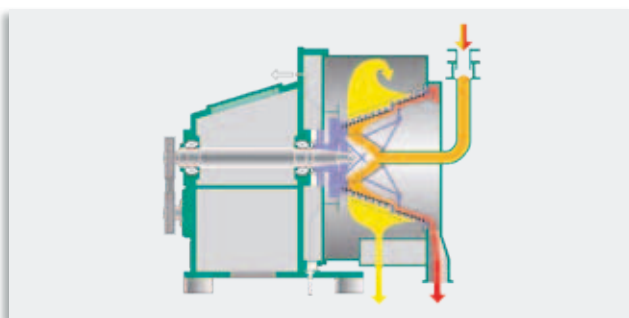
## **SHS pusher centrifuge**

In the pusher centrifuge, the solid matter is retained on a wedge wire drum as a cake and transported in small increments by an oscillating motion of the pusher plate in an axial direction to the solids discharge area. With the low transport speed of the thick layer of retained solids, the machine design allows high residence time, low fines losses and minimal particle breakage. Furthermore, the multi-stage design allows high wash rates of the solids.



## **HSG vibrating centrifuge**

Our largest capacity machines, these vibrating centrifuges process up to 450 tph of solids. The particles are retained on the screen basket and conveyed from the small to the large diameter by an axial vibration superimposed over the centrifugal motion. The most common applications are dewatering coal, sea salt and sand.



## **TURBO-CASCADE sliding centrifuge**

The TURBO-CASCADE is specially developed for dewatering solids with a uniform particle size of 0.5 mm and larger.

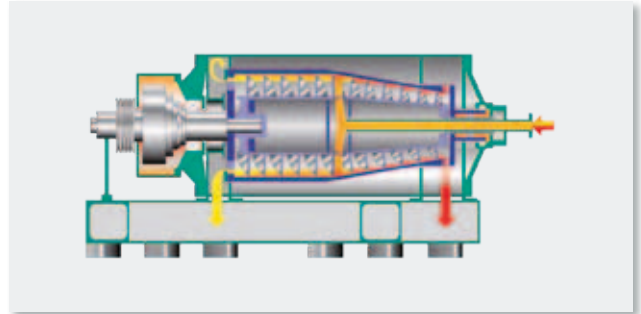
The particles slide individually, i.e. not in a closed layer, over the screens arranged in stages. Despite the very short residence time of the individual particles in the centrifuge, final moistures as low as 0.01 % can be achieved

For mechanical separation of solids from liquid, continuously operating centrifuges are the best solution technically and economically in nearly all cases.

They can dewater large quantities of solids to low final moistures, while needing little space, energy or time.

#### **TS / DZ / DZS decanting centrifuge**

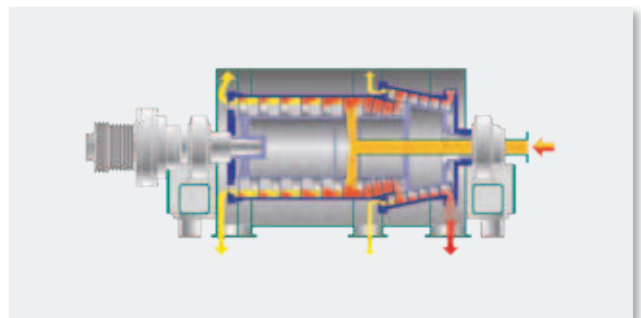
In decanting centrifuges, very fine solids are separated from liquids with a lower specific gravity. The solids sediment from the liquid due to the centrifugal forces inside the rotating bowl. The settled solids are then transported to the small diameter by a worm and discharged there. The clarified liquid exits the machine via an adjustable weir at the cylindrical end of the bowl.



#### **TWIN-CONE decanting centrifuge**

Like the normal decanter, the TWIN-CONE is equipped with a significantly larger drying cone at the end of the clarification drum.

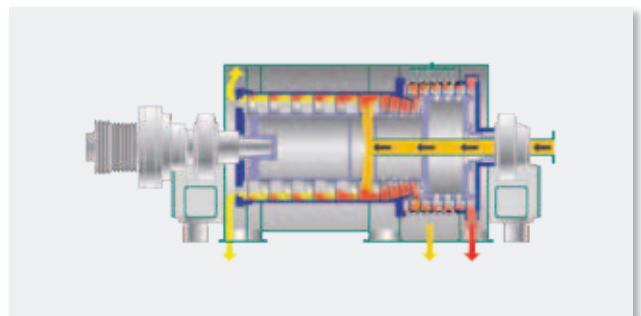
This feature provides more area for solids volume, additional dewatering with higher G forces and lower solids layer thickness.



#### **TURBO-SCREEN decanting centrifuge**

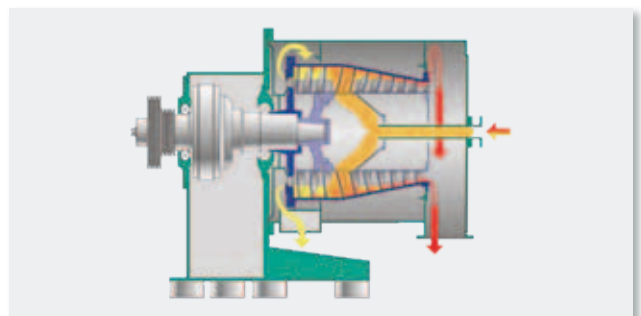
Similar to the TWIN-CONE, but instead of a larger drying cone, a large screen drum is used, which ensures the best possible dewatering at higher G force and lower solids layer thickness.

A high yield with minimal solids losses can be achieved by recirculating the separated liquid captured from this area of the machine.



#### **SHORT-BOWL decanting centrifuge**

The SHORT-BOWL decanter is designed with a bearing on one side only. This centrifuge has short rotating parts and is well suited for separating fine solids from liquid where a large difference in specific gravities are present.



#### **CENTRIFLEX laboratory centrifuge**

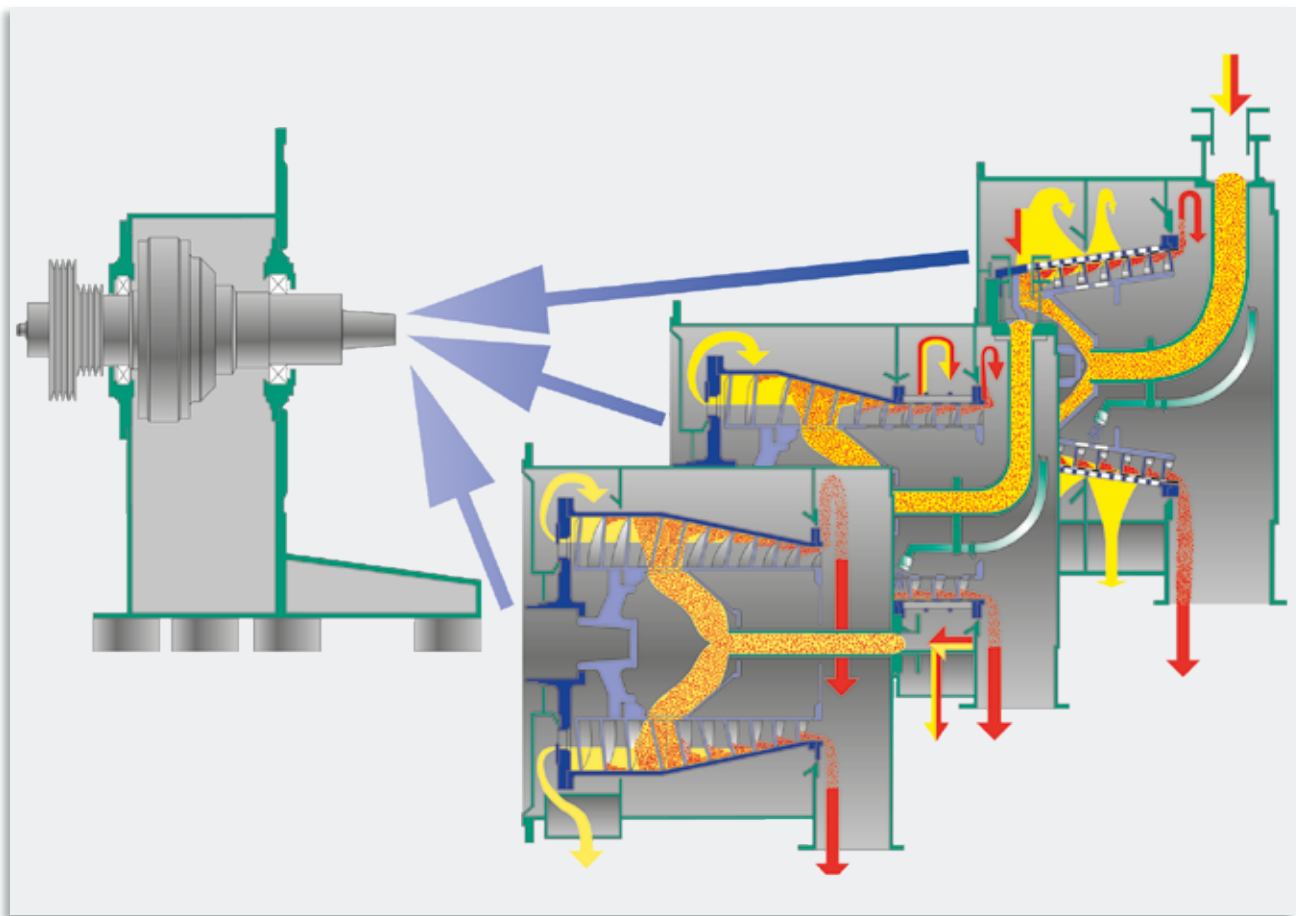
The laboratory centrifuge CENTRIFLEX is a universal centrifuge to examine the options for separation of solids/liquids mixtures under the influence of high centrifugal forces.

The wide range of inserts allow applications for filtration, washing, rinsing, clarification, continuous separation of two liquids and preparation of emulsions.



# Continuous Universal Centrifuge

for Laboratories and Pilot Plants



This continuously operating centrifuge was specially developed for use in laboratories and technical facilities. Due to the small frame size and the design structure, mobile use is also possible in industrial plants, with minimal transport and connection costs.

In addition to experimental use, the universal centrifuge is also suitable with its various equipment configurations for continuous operation in industrial separating tasks with low throughputs.

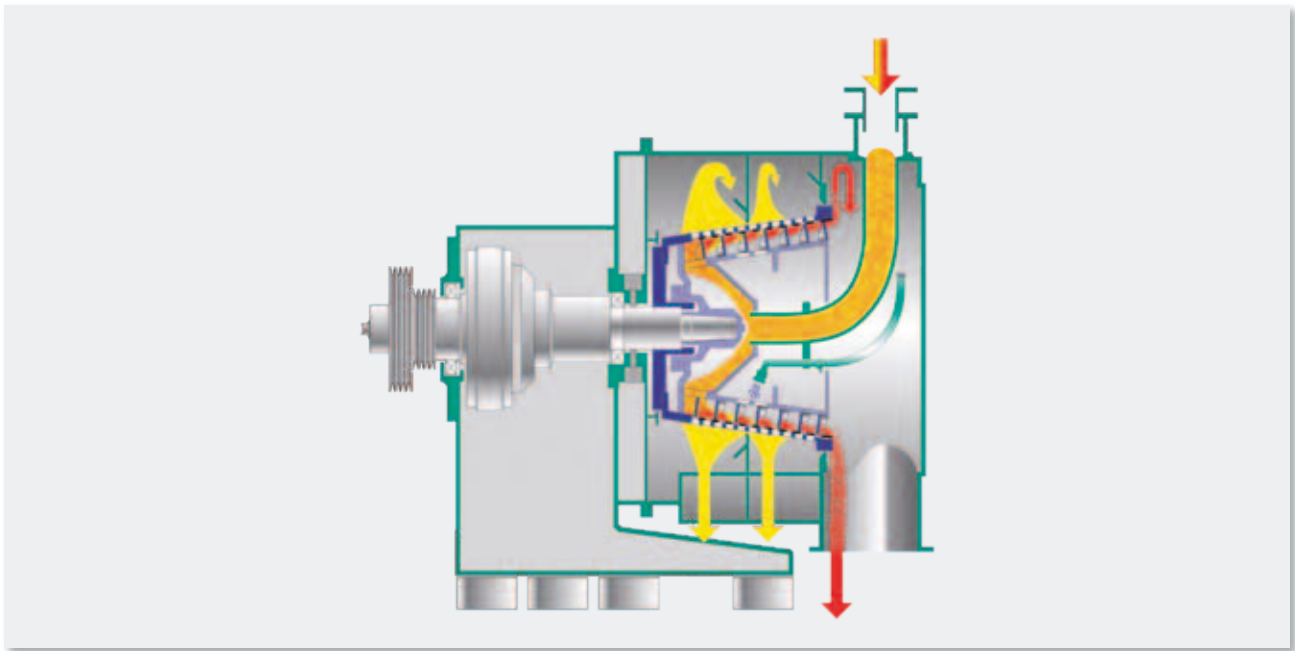
Using the identical bearing and drive unit, the following rotor configurations can be used for a wide variety of separating tasks:

- Solid bowl rotor (decanter)
- Solid bowl rotor with screen part (CONTHICK)
- Screen worm rotor (CONTURBEX)

The process parts along with the rotating centrifuge components are completely separate from the drive unit which allows quick and easy accessibility.

The centrifuge can be supplied with different drive arrangements to allow continuous adjustment of rotation speed. Gastight design is also available in combination with an ATEX safety package.

# CONTURBEX Screen worm centrifuge



## Description

The screen worm centrifuge consists of a drive component located in a bearing housing, the screen holding drum, the screen insert, the transport worm and the product housing enclosing the rotating parts.

The mixture of solid and liquid enters the rotating components via a central feed pipe and is deposited into the center cone of the worm body. The mixture is then accelerated and released onto the screen surface via feed ports at the small diameter of the worm body. This ensures even distribution onto the spinning drum even with fluctuations in the feed.

The rotating process parts are an overhung single bearing design. These components are typically conical design to reduce the coefficient of friction between the solids and the screen surface, allowing easier transport at the centrifugal forces.

The transport worm is concentrically placed inside the screen drum. The worm flight tips have a clearance distance set from the screen surface at 0.5 mm to 4 mm, depending on the product and process requirements.

The worm turns in the same direction as the screen drum, but at a small differential speed, and ensuring uniform acceleration of the solids. This also makes the machine very insensitive to variations in feed concentration and reduces or eliminates imbalances

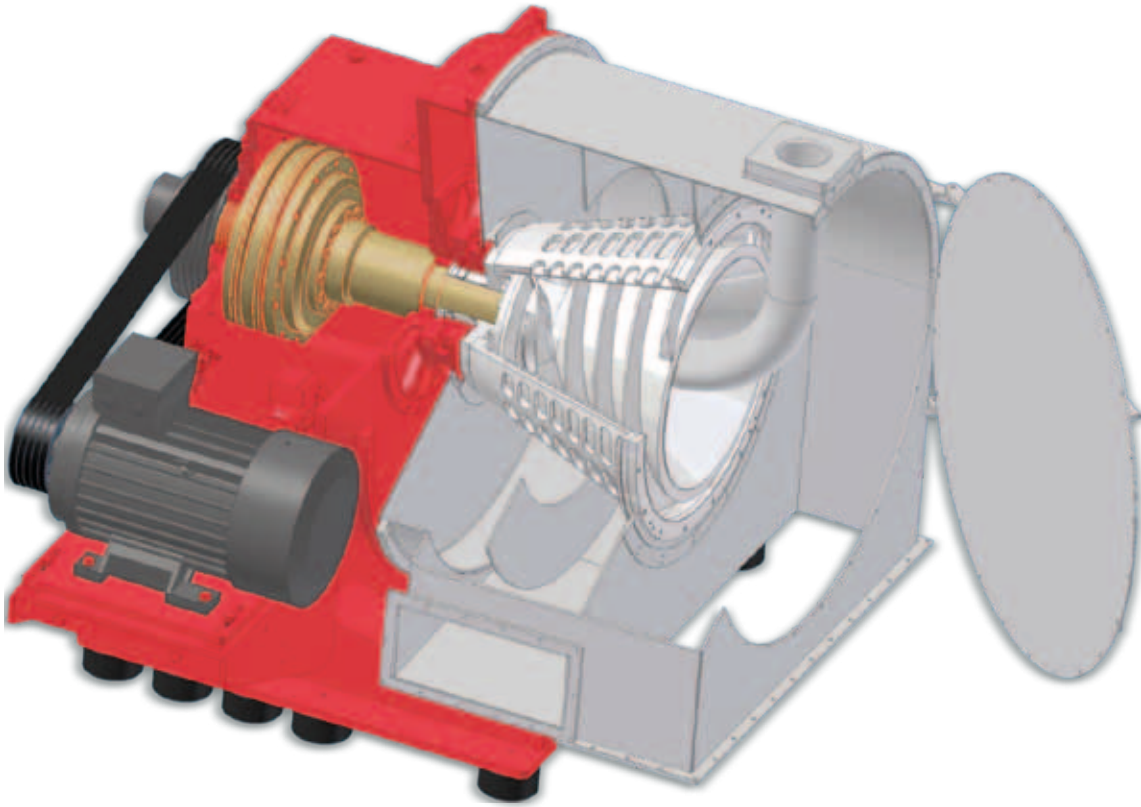
The feed outlet of the solid/liquid mixture inside the rotating components occurs at the smallest diameter of the drum, where the majority of the liquid is separated by the screen. Since the mixture is not subjected to high g forces in this area for dewatering, the power load required to spin the drum is much lower also resulting in decreased motor size and resulting operating cost.

The feed into the smaller diameter also transmits lower mechanical action onto the solids reducing particle damage and breakage.

A distinct advantage of the screen worm centrifuge is the formation of thin layers of the solids on the screen. During travel from the small to the large diameter, the layer of solid matter remains loose and is constantly "thinning" due to the increasing surface area of the screen allowing further dewatering without high g forces.

Preferred uses are for separations with particle sizes > 80 µm.

# The traditional design CONTURBEX



In the traditional design, the complete rotor unit is installed in a large bearing housing. The drum and the worm are overhung into the product collection housing.

The bearing housing also is the base frame for the machine and contains the lubrication oil reservoir and delivery system. The product collection housing is mounted to the front of the bearing housing via a large diameter flange.

The bearing housing is the main support element of the entire machine design.

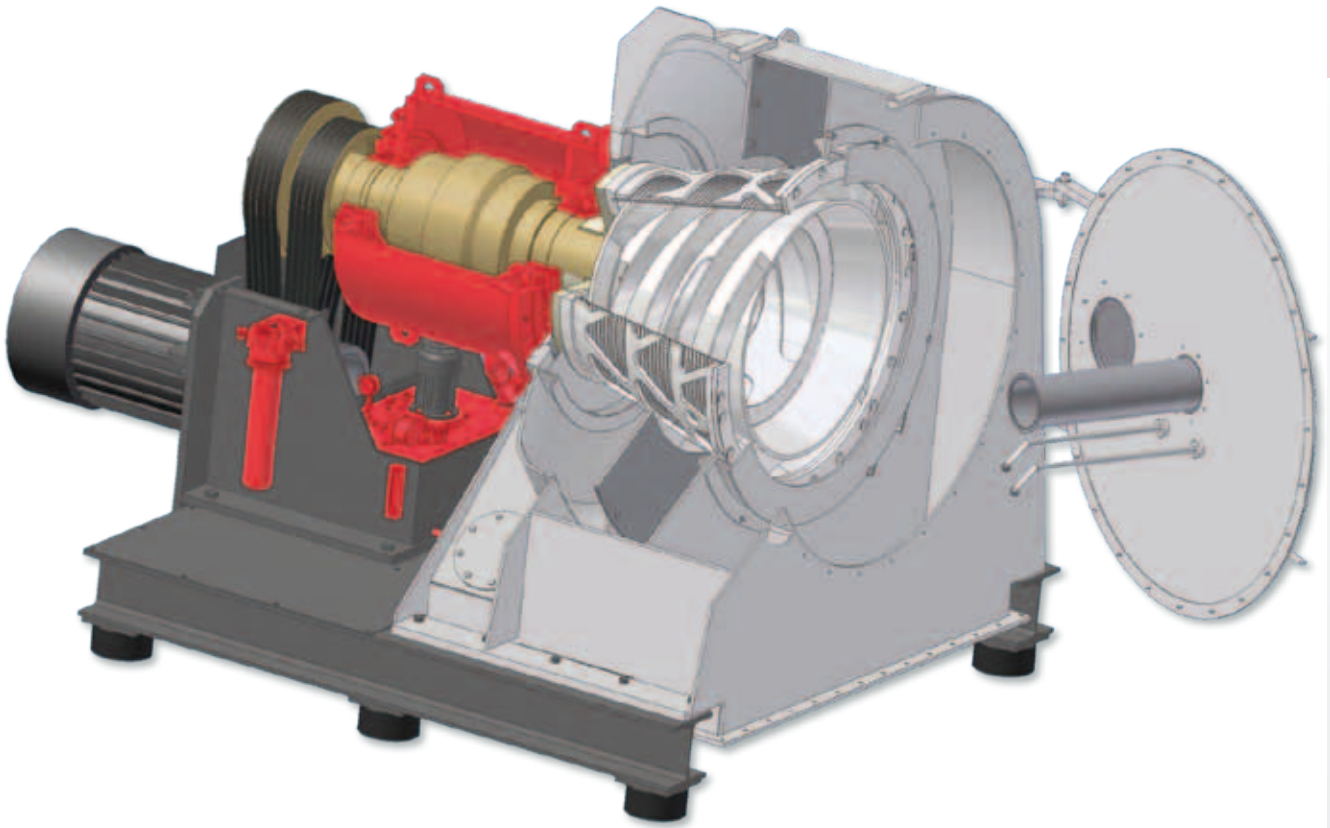
## Standard CONTURBEX Available frame sizes

Type		H 200	H 250	H 320	H 350	H 400	H 450	H 520	H 600	H 700	H 900	H 1000
Drive motor	approx. kW	3.0	5.5	7.5	11	15	22	30	37	55	75	90
Length	mm	700	910	940	1,150	1,150	1,150	1,480	1,560	2,150	2,400	2,600
Width	mm	880	1,050	1,165	1,500	1,500	1,500	1,920	2,000	2,100	2,600	2,700
Height	mm	570	800	950	970	1,150	1,150	1,470	1,470	1,650	2,600	2,600
Weight	kg	230	560	700	900	1,000	1,100	1,800	2,000	4,000	7,000	8,000

The effective output levels are based on the properties of the feed material and on the quality of separation.

We reserve the right to make any changes required by technical advances.

# The CX design CONTURBEX



The CX series is our update machine design with fewer than 20 main components, which are divided into four assemblies:

- Base frame
- Rotor unit with bearing casing
- Product housing
- Oil supply

The simplified housing of the rotor is self-centering, together with the bearing casing, and always guarantees correct centering axis, independent of the product housing, resulting in optimal running characteristics. With this simplified rotor and bearing design, drive components are quickly and easily accessible. This also allows the user to maintain a smaller quantity of spare parts if desired.

## CX - CONTURBEX Available frame sizes

Frame size Type		II CX			III CX			IV CX		
Drum diameter	mm	600	700	800	900	1,000	1,100	1,200	1,300	1,500
Drive motor	approx. kW	45	55	75	90	90	110	110	137	250
Length	mm	approx. 2,000			approx. 3,000			approx. 4,200		
Width	mm	approx. 2,000			approx. 2,400			approx. 2,760		
Height	mm	approx. 1,700			approx. 2,300			approx. 2,600		
Weight	kg	max. 4,000			max. 8,000			max. 13,000		

The effective output levels are based on the properties of the feed material and on the quality of separation.  
We reserve the right to make any changes required by technical advances.

# General CONTURBEX design variables

For the wide variety of processes and products, the Conturbex can be equipped with components to meet the specific application requirements. In addition to vapor or gas-tight applications, the following variations are available:

## **Different angles of screen drum inclination, based adjusted on the product and process:**

- 0° to 20°

## **Choice of screen designs to suit the application:**

- Split-screen inserts
- CONIDUR® screen plate inserts
- Laser screen plate inserts
- Wedgewire screen

## **Three drive unit design possibilities are available:**

- Cyclo gearbox
- Siebtechnik planetary gear drive
- Hydraulic drive unit ( variable worm rotation speed)

It is also possible to supply two drive motors (drum and worm) with frequency control changing speeds.

## **Sealing arrangements are based on the product process and are standardized in the following designs:**

- open labyrinth seals
- PTFE chamber packing for vaportight design
- PTFE chamber packing for gastight design
- Pressure-tight design with slide ring seal

## **Material designs**

All components that come into contact with the centrifuged material can be manufactured in corrosion resistant, austenitic steel, Hastelloy, nickel, titanium, etc. based on the application.

Machines for the coal and sand industries are typically manufactured entirely from carbon steel. For abrasive feed material, wear resistant materials and coatings are available for every application.

## **CIP cleaning**

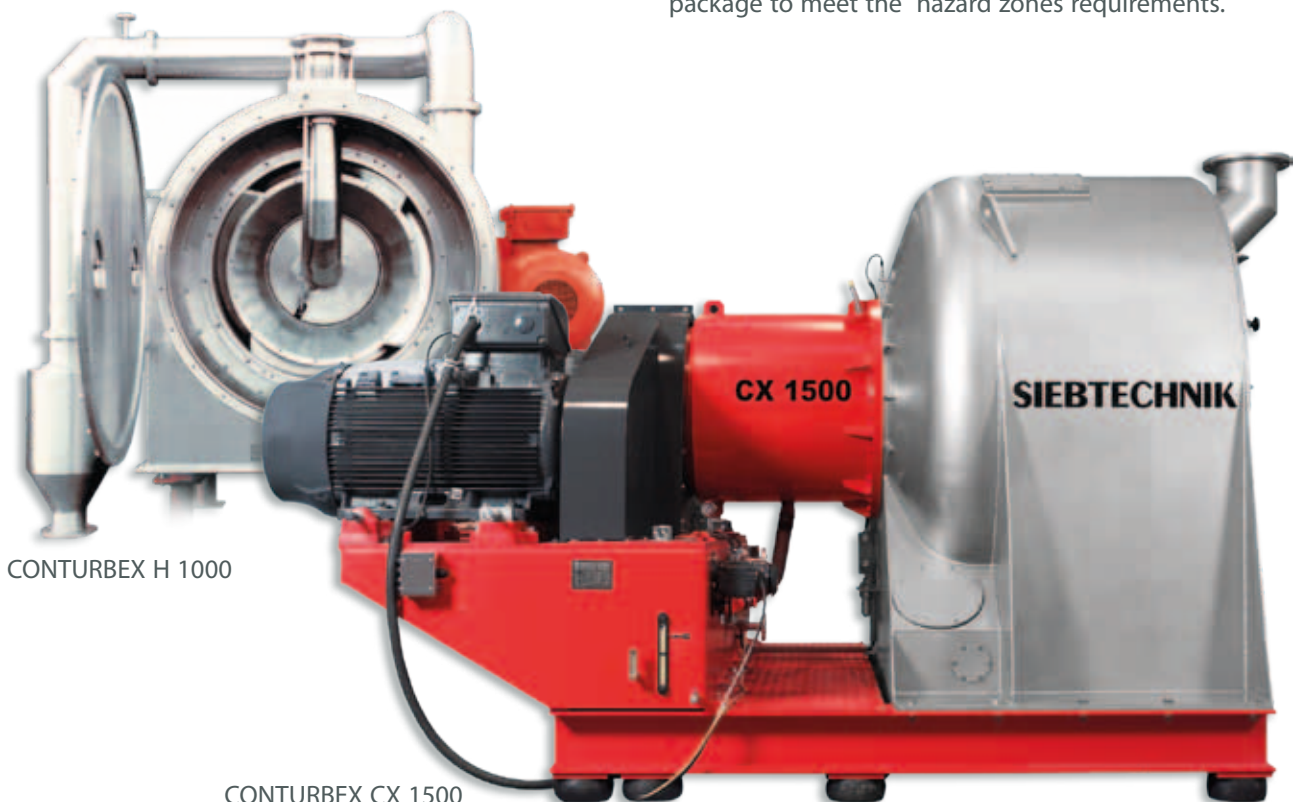
Every Conturbex centrifuge is equipped with cleaning nozzles as standard, to remove any build-up of material in the wet or dry areas of the product housing during shutdown.

However, if high demands are placed on the machines, they can also be supplied with a CIP cleaning system. This includes special rinsing pipes, special nozzles and, if necessary, a slow speed drive to allow flooding of the rotating parts.

## **ATEX design for**

### **Explosion protection zones**

In accordance with EU directive 94/9/EC (ATEX 100a), all Siebtechnik centrifuges can be equipped with an ATEX package to meet the hazard zones requirements.



CONTURBEX H 1000

CONTURBEX CX 1500





CONTURBEX H 1000 during operation

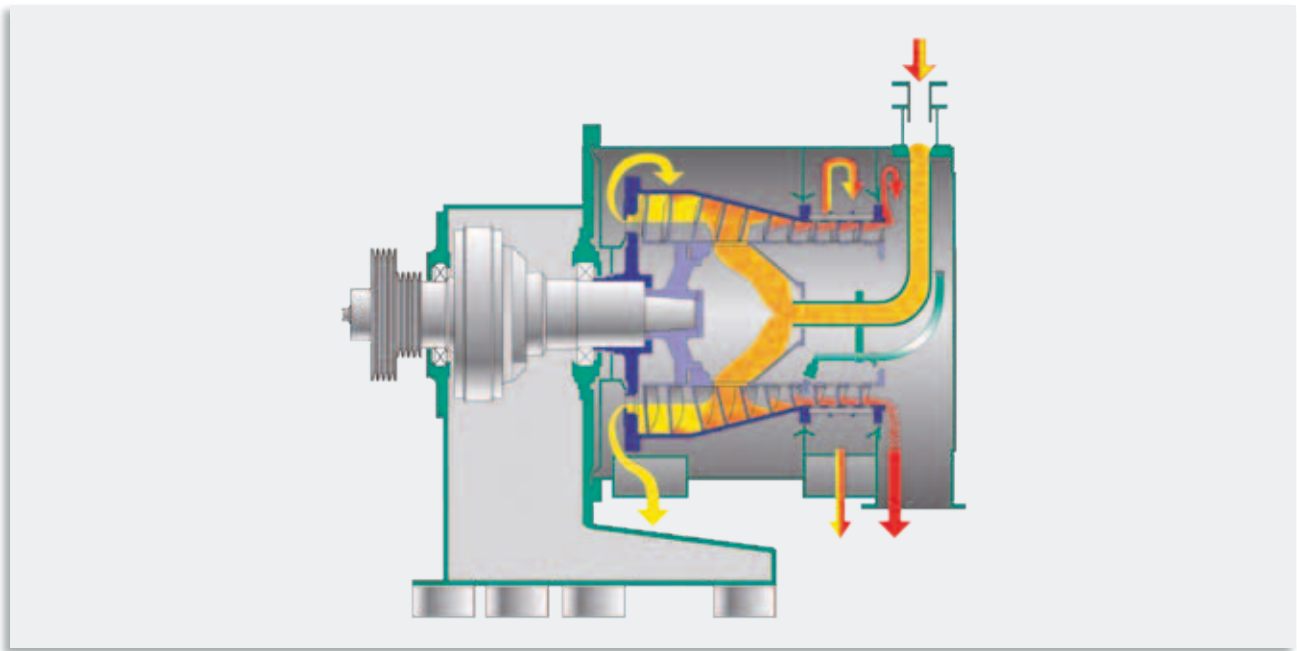
### Successfully used for:

Acetic acid  
 Adipic acid  
 AH salt  
 Ammonium persulphate  
 Ammonium phosphate  
 Ammonium sulphate  
 Ammonium thiosulphate  
 Animal fats  
 Anthracene  
 Aspirin  
 Bisphenol  
 Borax  
 Carboxymethylcellulose  
 Citric acid  
 Coal slurry  
 Coffee freeze concentrate  
 Coffee grounds  
 Copperas  
 Cotton linters  
 Crystal soda  
 Dimethylterephthalate  
 = DMT from methanol  
 Dipterex  
 Disodium phosphate  
 Fungus mycelium  
 Glauber salt  
 Glycine  
 Ion exchangers  
 Iron sulphate heptahydrate

Lactose  
 Manganese sulphate  
 Methylcellulose  
 Monosodium phosphate  
 Naptha ionate  
 Nut fragments  
 Nylon cuttings  
 Onion mousse  
 Oxalic acid  
 Palm pits  
 Pearl polymers  
 Plant extracts  
 Plaster  
 Plastic granulate  
 Plexiglas beads  
 Polyethylene  
 Polymethacrylate  
 Polystyrol  
 Polyvinyl acetate  
 Polyvinyl alcohol  
 Polyvinyl chloride  
 Potash alum  
 Potash solvent residue  
 Potassium bicarbonate  
 Potassium bichromate  
 Potassium carbonate  
 Potassium chloride  
 Potassium formate  
 Potassium monochromate

Potassium persulphate  
 Potassium phosphate  
 Praline fragments  
 Pyrazolone  
 Regenerated rubber  
 Rock salt  
 Silver nitrate  
 Sodium acetate  
 Sodium bisulphite  
 Sodium carbonate  
 Sodium chlorate  
 Sodium chloride  
 Sodium formate  
 Sodium gluconate  
 Sodium metaborate  
 Sodium nitrate  
 Sodium perborate  
 Sodium phosphate  
 Sodium sulphate (wf)  
 Sodium sulphite  
 Sodium tetraborate  
 Sodium thiosulphate  
 Tartaric acid  
 Tin sulphate  
 Trisodium phosphate  
 Vegetables  
 Zinc sulphate  
 and many others

# CONTHICK Screen worm centrifuge with pre-thickening



## Description

The design of this centrifuge is based on the technology of our CONTURBEX screen worm centrifuge with a pre-thickening area for high efficiency separation of low solids concentration slurry as well as high recovery of fines.

The purpose of this centrifuge is to separate solids from liquids in a slurry. The slurry is fed via an inlet pipe to the pre-thickening area of the centrifuge via openings at the center in the worm body.

The main liquid will be discharged at the rear of the bowl via an adjustable overflow (weir) to obtain a clean liquid separation (filtrate).

The solids are pre-thickened and transported to the screening area where final dewatering and solids washing, if needed, takes place. Both liquid streams can be discharged individually or combined through a double or single filtrate discharge cyclone.

The worm conveys the solid matter through the cylindrical screening section to the discharge casing. There can be a relatively small loss of solids in the screening area which can be captured by recycling back with the feed.

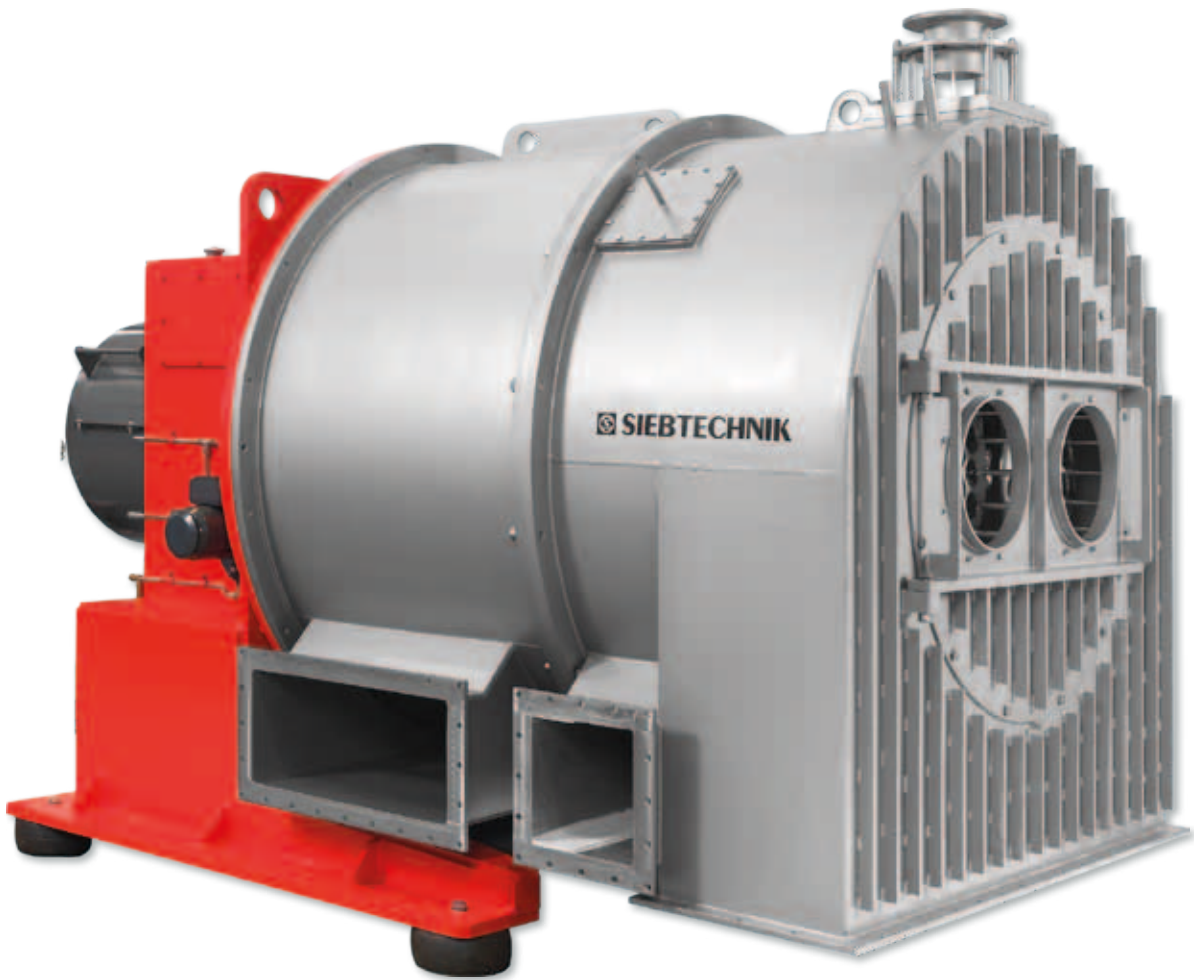
The centrifuge is typically supplied with a wedge wire basket. If required, a special screening plate can be used when particles sizes very fine. In either design, the screening elements can be changed very easily without disassembling the machine or removing any rotating parts.

## Typical applications

- Crystals, granulates or fibres with good sedimentation characteristics
- Particle size  $d' > 0.05$  mm in RRSB diagram
- Solids concentration in the feed 0 - 60 % by weight

## The major advantages

- Long service life of the screen elements
- High yield / minimal loss of solids
- Low residual moisture
- All the advantages of the overhung design:
  - Simple replacement of screens without disassembly
  - Problem-free realization of gastight design
  - Conversion of an existing CONTURBEX into a CONTHICK



### Successfully used for:

Carnalite  
 Erithrite  
 Isomaltose  
 Ketogluonic acid  
 Mefformine  
 Pentaerythrite  
 Potassium chloride  
 Potassium phosphate  
 Potassium sulphate

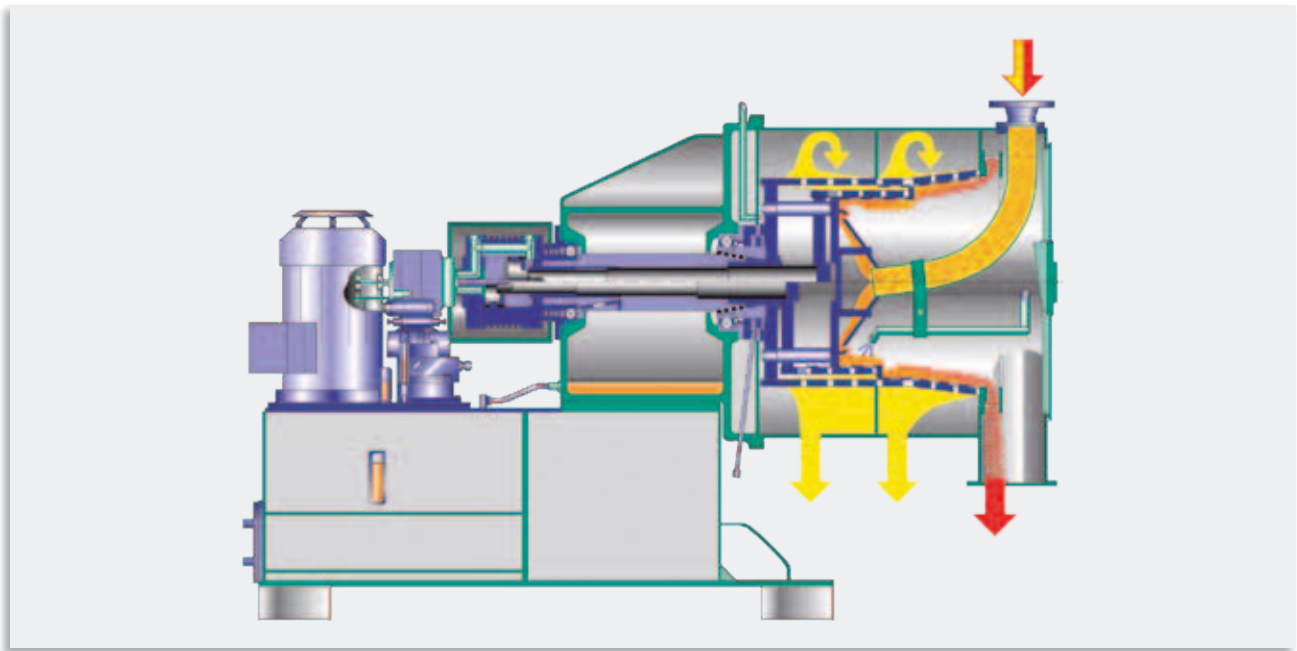
Silica gel  
 Sodium chloride  
 Sodium pyrosulphite  
 Sodium sulphite  
 Strontium nitrate  
 Sulphanilic acid  
 Vinasse  
 Walnut shells

### Standard frame sizes

Type CONTHICK	D / d	240/180	320/240	450/340	600/450	800/600	1000/750	1200/900
Drive motor	approx. kW	5.5	7.5	15	30	55	90	132
Length	mm	1,150	1,200	1,550	1,800	2,250	2,700	3,200
Width	mm	1,200	1,200	1,550	2,000	2,100	2,660	3,100
Height	mm	800	850	1,100	1,300	1,800	2,100	2,300
Weight	kg	700	750	1,300	2,000	4,200	7,500	10,000

We reserve the right to make any changes required by technical advances.

# SHS Pusher centrifuge



## Function and design variables

The pusher centrifuge belongs to the group of continuously working filtration centrifuges. The solids are retained as a cake on the wedge wire basket and transported by an oscillating step-by-step movement of the inner basket axially in the direction of the solids discharge. With the pusher centrifuge, the transport speed of the solids on the wedge wire basket is slower than with a worm/screen centrifuge. This results in a longer retention time of the material allowing increased wash efficiency and lower discharge moistures. The size of the separated solid particles is preferably greater than 80  $\mu\text{m}$ . The thick, dense filter cake ensures a good yield of even very fine solids.

Both factors – long retention time and dense filter cake – allow additional dewatering of solids with high fines content coming from other types of filters, e.g. filter press or belt filters.

For the widest range of uses, SIEBTECHNIK has developed different components for this pusher centrifuge, which allows the final design to meet the specific application.

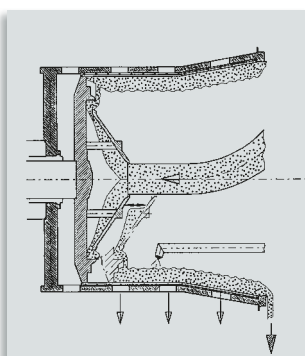
Currently we manufacture 13 sizes with drum diameters from 250 mm to 1200 mm depending on the process and production rates.

SIEBTECHNIK pusher centrifuges are designed with one, two or three stage rotating parts based on the application and filtration rate.

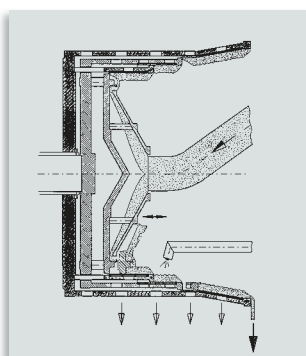
The machine design is dependent on the operational factors:

- Type of product
- Particle size
- Solids concentration
- Product washing

One-stage  
cylindrical rotor - conical



Three-stage  
cylindrical rotor - conical

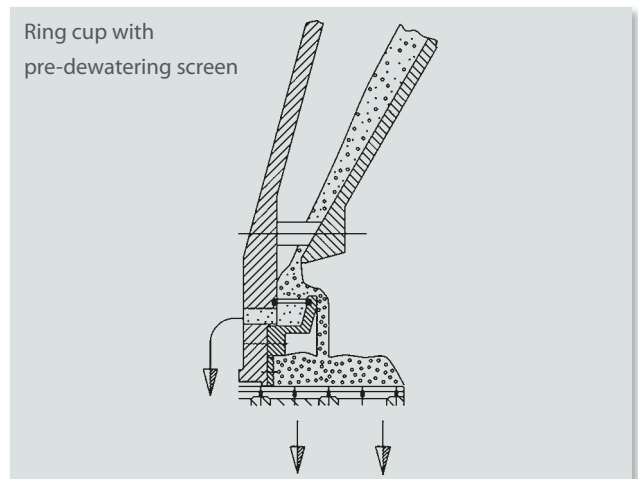


For many application cases, the outer basket is a cylindrical-conical (our "ZK") design. This "ZK" design increases the release of the trapped liquid inside the filter cake. The conical section of the "ZK" machine also reduces the energy required to transport the solids to discharge.

The patented filling system with acceleration cone and ring pocket ensures extremely gentle acceleration and uniform distribution of the solids. Even with unfavorable feed conditions, this results in reduced abrasion in the feed zone of the centrifuge.

This same ring pocket can be equipped with a screening element to predewater the slurry before it reaches the screen basket. This optimizes cake formation in the feed zone of the machine and allows lower feed concentrations to be successfully handled.

Separate mother liquor and wash liquid discharges can be supplied via internal partitions within the filtrate area of the product housing.



Advantages of SIEBTECHNIK pusher centrifuges due to product requirements:

- a long residence time for the solids is required
  - ⇒ slow solids transport speed
- the loss of solid matter in the filtrate must be low
  - ⇒ thick, dense filter cake (internal filtration)
- crystal breakage and abrasion must be low
  - ⇒ no mechanical stress from transport elements, patented filling system
- intensive washing of the filter cake is required
  - ⇒ direct spray of the washing medium onto the cake
- high abrasion from product is expected
  - ⇒ low transport speed, wedgewire screen in the direction of transportation, wear resistant materials of construction, patented filling system



## Design characteristics and advantages

- Exact separation of the pusher hydraulics and bearing system – no high pressure hydraulic oil near the process area of the machine
- The hydraulic multipath rotating unit is externally mounted and easily accessible
- The hydraulic control unit is also externally mounted and contains an integrated safety valve
- Stroke length is controlled via limit switches mounted at the rear of the machine and can be readily and easily adjusted; this is totally independent of the pressure setting.
- Pump unit is submerged in the machine housing but easily accessible on the “hydraulic aggregate”; this arrangement yields low noise level during operation
- Automatic continuous lubrication of the main bearings by oil drip feed
- Secure seal between drive and process area - no high pressure oil near product
- No special foundation or support required due to vibration

## Special versions

- Feed system with pre-dewatering (DBP patented)
- Product feed via screw conveyor
- Separate discharge and ventilation of mother liquid and washing liquid with double filtrate cyclone
- Gastight execution
- Explosion-proof execution in accordance with Directive 94/9/EC (ATEX 100a)
- Food-service execution
- Other special executions available on request



## Standard frame sizes

Nominal diameter	250	350	450	530	600	800	900	1000	1100	1200
One-stage cylindrical and cylindrical-conical	x	x	x	x	x	x	x	x	x	x
Two-stage cylindrical and cylindrical-conical	x	x	x	x	x	x	x	x	x	x
Three-stage cylindrical and cylindrical-conical		x			x	x	x	x	x	x
Length approx. mm	1,500	1,750	1,900	2,600	2,600	2,750	2,750	3,300	3,675	3,750
Width approx. mm	850	950	1,100	1,800	1,800	2,000	2,000	2,400	2,400	2,400
Height approx. mm	950	1,020	1,050	1,700	1,700	2,050	2,050	2,150	2,250	2,250
Operating weight approx. kg	800	1,150	1,900	5,000	5,600	8,000	10,000	14,000	15,000	16,000

We reserve the right to make any changes required by technical advances.



### Successfully used for:

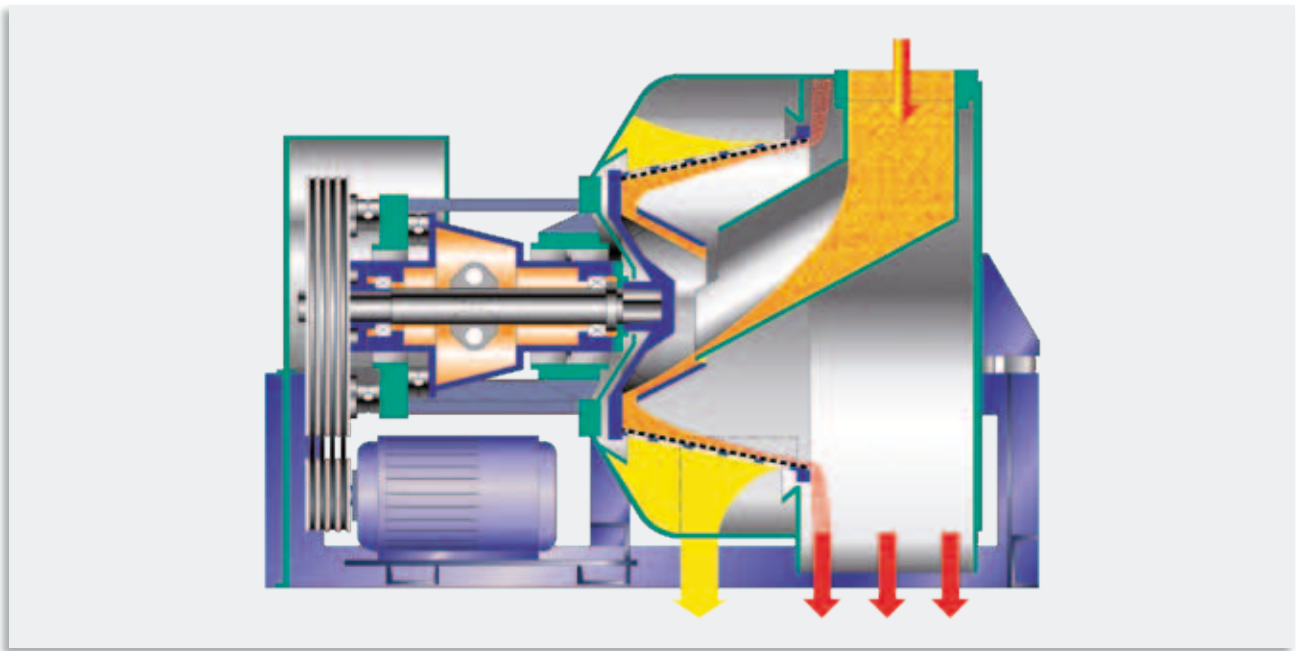
ABS polymerisate  
 Adipic acid  
 Ammonium chloride  
 Ammonium hydrogen carbonate  
 Ammonium sulphate  
 Animal bones  
 Chlorine hydrate  
 Copperas  
 Dicalcium phosphate anhydride  
 Dicalcium phosphate dihydrate  
 Dispersion rubber  
 Flotation concentrate and residues from aluminum  
 Fructose  
 Glauber salt

Hexamine  
 Iron sulphate heptahydrate  
 Lactose  
 Melamine  
 Nickel sulphate  
 NPK fertiliser  
 Polyacrylate  
 Polyethylene  
 Potassium sulphate  
 Raw phosphate  
 Rock salt  
 Rough coal slurry and flotation concentrate  
 Silicon fluoride  
 Sodium bicarbonate

Sodium chloride  
 Sodium formate  
 Sodium phosphate  
 Sodium sulphate  
 Sorbic acid  
 Subsequent dewatering  
 Tartaric acid  
 Urea  
 Zinc sulphate ..and many others

## HSG Vibrating centrifuge

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### Description

The vibratory centrifuge is our most effective centrifuge regarding solids throughput capacity. Transport of the solids over the conical screen is achieved due to the relationship of the screen design angle and the axial vibration of the basket.

To ensure a controlled sliding speed of the solids, the basket angle of inclination is less than the coefficient of friction for the solids to be dewatered. The axial vibration generated by the machine is high enough to overcome the remaining friction between the screen and the solids. Since the vibration amount is maintained within relatively narrow limits by design, vibratory centrifuges typically operate with centrifugal forces less than 120 g.

Because of this, the primary use is coarse or other bulk materials which can be easily dewatered such as washed coal, middlings or refuse from coal preparation, dissolving and washing sediments from potash production, sea salt, concrete sand, etc.

### Design

Our HSG centrifuges are designed with a two mass operating principle. The screen basket, shaft and bearing housing form the small mass of a vibration system which is coupled via elastic mounts to the large mass, mainly consisting of a crossbeam and the product housing. The vibrations are generated by rotating off-center weights in a resonance range lower than the natural vibration of the elastic mounts. This results in very low power requirement to generate very reliable vibration behavior.

When the feed loading increases to the machine, it also causes an increase to the small mass components. This reduction in speed due to loading causes the vibration to become more resonant. The result is an automatic increase in the amplitude and conveying speed of the solids on the basket.

Due to this design, the machine is self adjusting to fluctuations in the feed within a wide capacity range - it „works itself free“ - resulting in very reliable and trouble-free operation.

The basket and the vibration generator are driven by standard design motors via V-belts. This allows simple changes to adapt the speed to the operational conditions.

The main motors and the oil container with pump for lubrication of all bearings are mounted to the base frame. The entire machine is mounted on supplied vibration isolators.

Like all of our continuous centrifuges, the vibratory centrifuge can be installed even on higher floor levels without special foundation or reinforcement.

### Materials of Construction

The profile wires of the wedge wire baskets are made of stainless steel. The inlet cone and feed pipe are manufactured of wear and/or corrosion resistant materials if required.

The product housing is made of carbon steel and can be supplied with rubber, ceramic or other linings as wear protection in the solids discharge area.





### Successfully used for:

#### Coals:

Brown coal  
 Fine coal  
 Stock coal  
 Coarse slurry  
 Middlings  
 Washed dirt

#### Salts:

Flotation residue  
 Flotation concentrate  
 Potassium solution residue  
 KCL coarse crystallisate

#### Kieserite

Sea salt

#### Sands:

Concrete sand  
 Pumice sand  
 Iron ore sand  
 Chalk sand  
 Shell sand  
 Quartz sand

#### General:

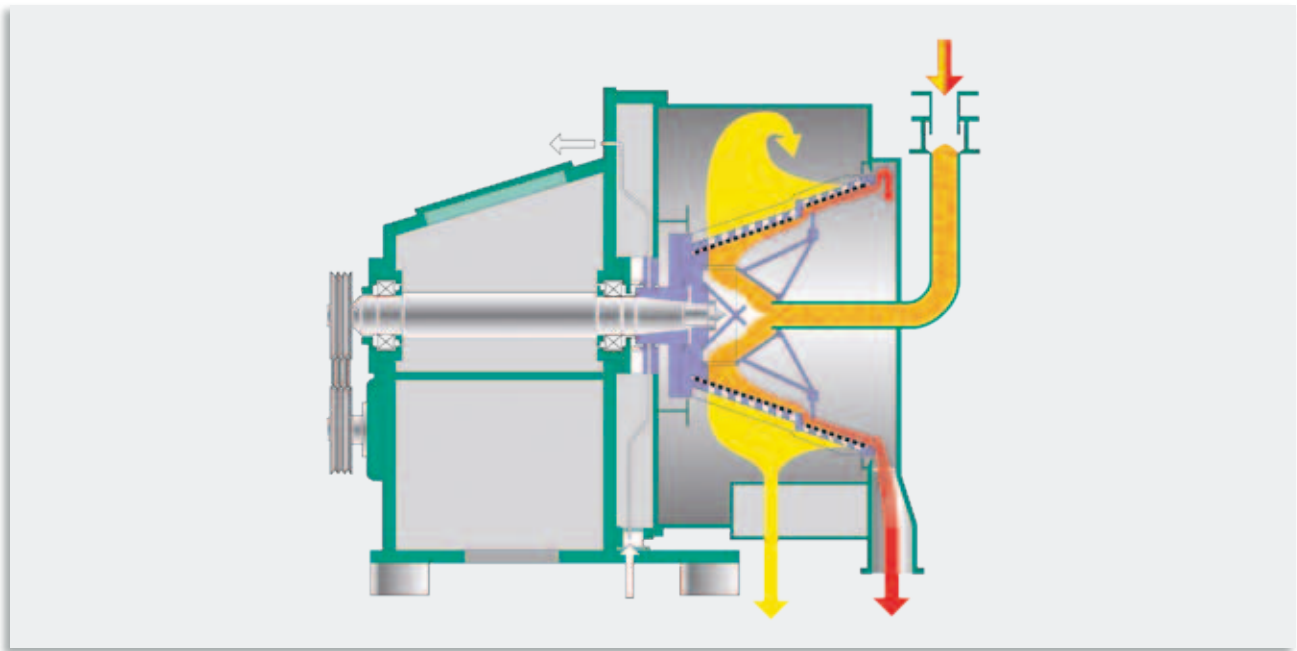
Wood chips

### Standard frame sizes

Type		HSL 600	HSG 800	HSG 1000	HSG 1100	HSG 1200	HSG 1300	HSG 1500	HSG 1650
Drive motor	approx. kW	7.5	15	22	30	37	55	75	110
Length	mm	1,500	2,070	2,200	2,400	2,400	2,900	3,950	4,175
Width	mm	1,270	1,650	1,900	2,000	2,000	2,230	2,610	3,075
Height	mm	1,200	1,425	1,650	1,770	1,770	2,040	2,340	2,815
Weight	kg	1,000	2,500	3,400	3,800	3,900	7,000	9,000	13,500

We reserve the right to make any changes required by technical advances.

# TURBO-CASCADE Sliding centrifuge



## Description

This screening centrifuge was developed for dewatering coarse solids with uniform particle sizes greater than 0.2mm. The solid particles slide individually, not as a closed layer, over the screen which is subdivided into steps or „cascades“ to yield better dewatering.

Guide plates which rotate with the basket carry a mixture of air and solids directly over the screens and prevent jumping over the steps too quickly and missing any screening area.

Even though the solids are subjected only exposed to the centrifugal force for only a very short time, the surface discharge moisture can be reduced to some tenths of a percent based on the solids characteristics. In accordance with the requirements and operating conditions, perforated plates or wedgewire screens are used.

With special handling and finish of the screening media used, no blinding occurs even with pointed particles or “threaded” pieces.

Generally the TURBO-CASCADE is gas- or vapor-tight construction with recirculation of the air from the filtrate cyclone back into the product housing. The dewatered solids are discharged tangentially via a pipe which can be positioned in any direction.

To eliminate large quantities of water in the feed, we can also deliver prethickeners or static dewatering screen to make the machine size as small as possible.

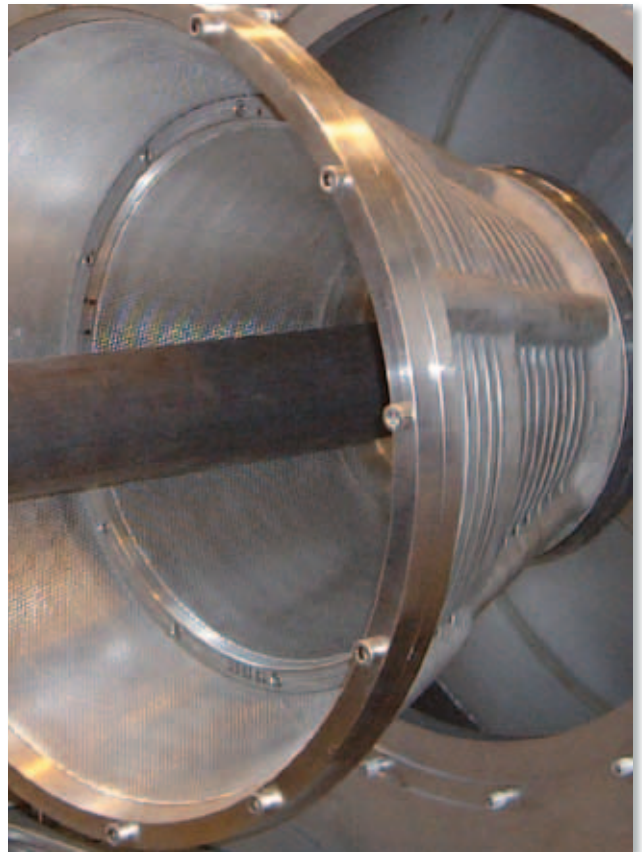
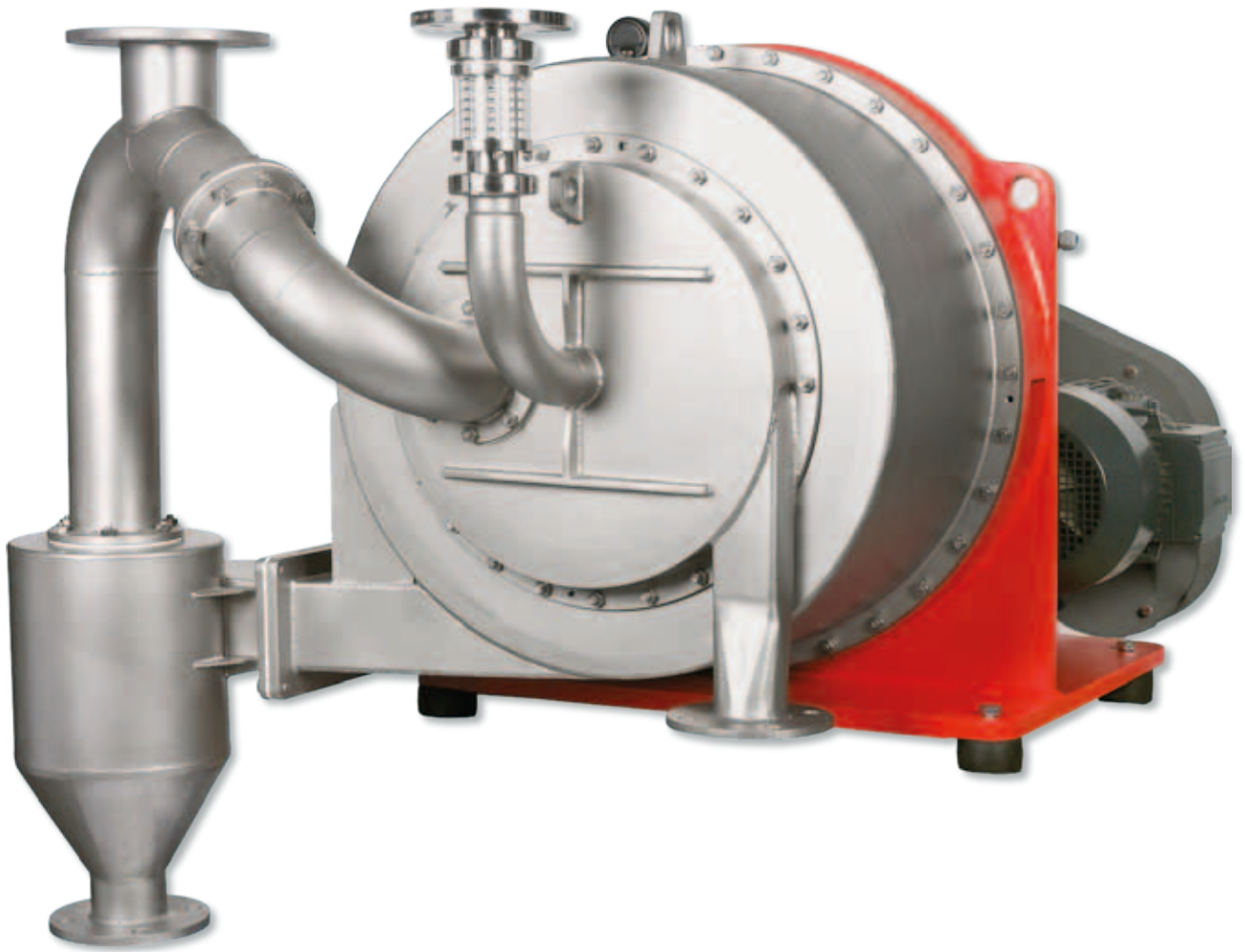
## Successfully used for:

Nylon 6  
Nylon 66  
Polyester  
Polypropylene  
Pearl polystyrole

## Standard frame sizes

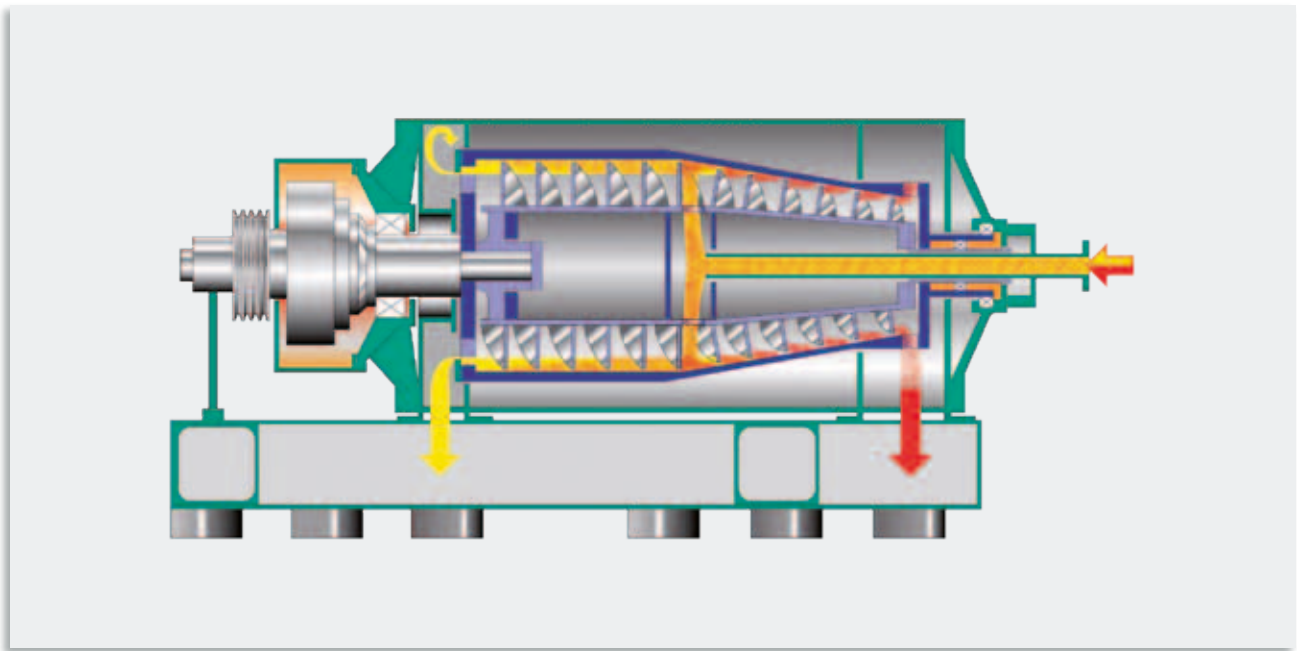
Type	TC	330	400	520	700
Drive motor	approx. kW	5.5	7.5	11.0	22.0
Length	mm	1,150	1,250	1,550	1,900
Width	mm	800	800	1,450	1,800
Height	mm	800	850	1,350	1,700
Weight	kg	550	650	1,250	1,800

We reserve the right to make any changes required by technical advances.



## TS / DZ / DZS Decanting centrifuge

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### Description

In solid bowl centrifuges, clarification of the liquid takes place mainly in the cylindrical section, and the dewatering of the solids takes place by filtration or compression of the solids cake in the conical part of the bowl.

Even very fine solids can be separated by decanter centrifuges when the sedimentation rate in the feed liquid is sufficiently high. This "settling rate" is determined by particle size, particle shape, difference in density between solids and liquid and also the viscosity of the liquid.

Many times, this "settling rate" can be greatly improved by heating or adding flocculation agents to the feed slurry. Also the geometry and operating parameters of the machine play an important role.

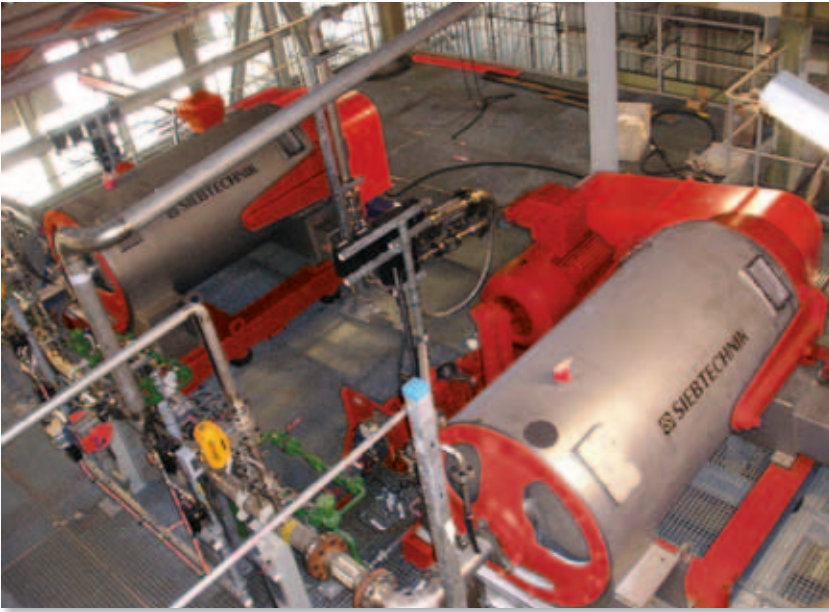
### Design

SIEBTECHNIK decanting centrifuges work on the so called counter-flow principle. This means, that the suspension to be separated is introduced approximately in the center of the bowl. The sedimented solid material is transported toward the small diameter by the worm which rotates at a different speed than the bowl. The clarified liquid flows out of the bowl at the large diameter.

The height of the liquid level in the bowl and the resulting ratio of clear liquid and dry solids can be continuously adjusted. This permits optimum control of the required separation.

The differential speed between worm and bowl is done with a robust and well proven gear unit. The standard drive arrangement is via V-belts and, depending on the required rotating speed combination, the centrifuge is equipped with a single drive (fixed eccentric shaft) or double drive design (driven eccentric shaft).

## TS decanter



Decanters of the TS series are typically used in gastight process systems. The closed process housing in combination with proven sealing designs at the small shaft diameters and the design coordinated with the precise operating conditions give this centrifuge series a very high degree of reliability.

### Installation and disassembly of bowl and worm (TS series)



## DZ decanter (pedestal bearing design)



The DZ series can also be supplied in a vapor-tight and gastight design. For these applications, the product housings are manufactured in two pieces and sealed with chamber rings. The geometry of the rotating parts is designed for the specific separation requirement. The rotating assembly is carried by pedestal bearings located outside the product housing. Machines with bowl diameters greater than 1000 mm are standard design in the DZ series.

# DZS screen decanter

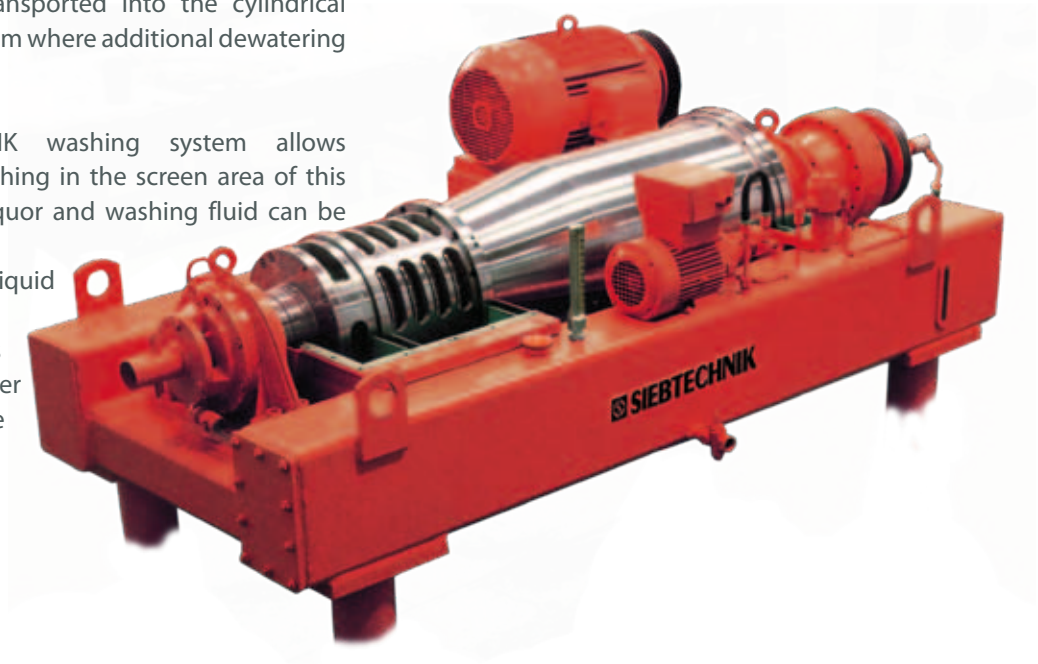
The screen decanter is a combination of a solid bowl decanting centrifuge and a screen worm centrifuge with exceptional dewatering results for crystalline and granular products.

In the decanter component, the feed suspension is first pre-thickened, i.e. it is extensively dewatered in the conical part of the solid bowl. The liquid is clarified in the cylindrical part and finally discharged. The pre-thickened solids are transported into the cylindrical screen section by the worm where additional dewatering is achieved.

A special SIEBTECHNIK washing system allows particularly efficient washing in the screen area of this machine. The original liquor and washing fluid can be separately discharged. Due to the low residual liquid entering the screening section, fine solids losses are low and can be further reduced by returning the filtrate to the inlet of the centrifuge.

All decanter sizes listed in the SIEBTECHNIK program are available with a screening part. The large SIEBTECHNIK screen decanters can be equipped with screen segments that are replaceable from the outside of the machine, eliminating disassembly and removal of the rotating components.

All SIEBTECHNIK advantages and equipment options are available for this centrifuge design also.



## Decanter standard frame sizes DZ/TS series

Type		210	300	360	420	500	600	710	850	1000 (DZ)	1100 (DZ)	1200 (DZ)
Drive motor	approx. kW	5.5 - 11	10 - 22	18.5 - 30	18.5 - 45	22 - 50	30 - 90	45 - 110	55 - 160	120 - 200	132 - 315	200 - 250
Length	TS / DZ approx. mm	1,400	1,900	2,020	2,200	2,650	2,900	3,300	3,500	4,570	4,770	5,060
Length	TSE / DZE approx. mm	1,700	2,200	2,380	2,620	3,150	3,500	4,010	4,000	5,370	5,870	6,260
Length	TSL / DZL approx. mm	2,000	2,500	2,740	3,040	3,650	4,100	4,720	5,200	6,570	6,970	7,460
width	TS, TSE, TSL DZ, DZE, DZL approx. mm	1,100	1,370	1,500	1,750	2,035	2,060	2,580	2,700	3,160	3,260	3,600
Height	TS, TSE, TSL DZ, DZE, DZL approx. mm	750	940	980	1,110	1,325	1,400	1,450	1,600	1,660	1,750	1,915
Weight	TS approx. kg	900	1,200	1,500	2,100	3,000	4,200	5,000	7,000	10,000	12,800	20,500
Weight	TSE approx. kg	1,200	1,400	1,800	2,450	3,500	5,000	6,000	8,300	12,000	15,500	23,000
Weight	TSL approx. kg	1,400	1,600	2,100	2,800	4,000	5,800	7,000	9,800	15,000	18,300	25,500

We reserve the right to make any changes required by technical advances.

# Basic types and range of variables

Based on their designs, the TS series is typically used for gastight applications and the DZ series for open applications. The more complex design of the TS series results in higher manufacturing costs. In the "normal supply" designs, we characterize both decanter series as "basic machines".

With the geometry and equipment options listed below, an extremely wide variety of decanter designs are available.

## Basic types

- TS series (closed housing)
- DZ series (pedestal bearing version)

## Bowl length

diameter/length ratio

- 1 : 1,5
- 1 : 2
- 1 : 3
- 1 : 4

## Bowl inclinations

- 6°
- 8°
- 10°
- 12°
- 15°



## Drive variations

- Simple drive (fixed eccentric shaft)
- Double drive (driven eccentric shaft)
- Hydraulic drive
- Variable frequency drive

## Separation

- Two-phase decanter
- Three-phase decanter

## Centrate discharge

- Free discharge
- Peeling disc (removal under pressure)
- Continuously adjustable peeling system (sump adjustment during operation, patent pending)

## Solids discharge

- Free discharge
- Discharge collecting device (racetrack)
- Re-slurrying trough (patent pending)

## Sealing systems

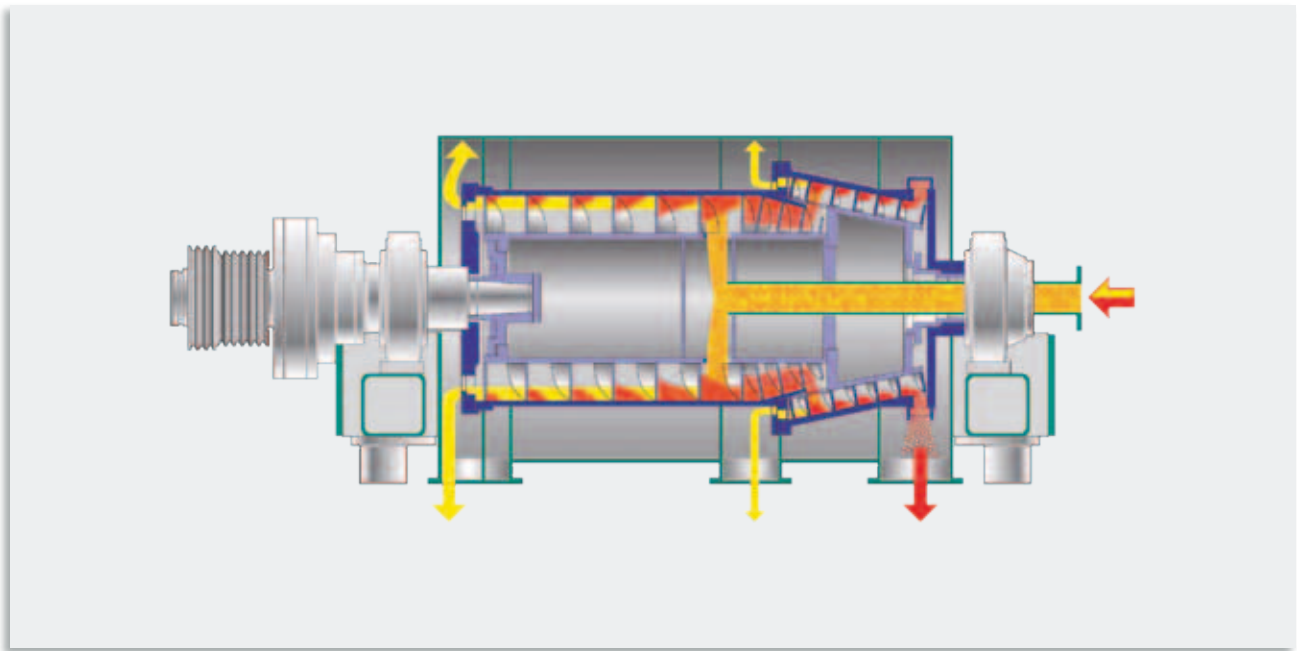
- Open labyrinth seal
- Vapor-tight design
- Gastight design with chamber packing
- Gastight design with slide ring seals
- Decanter in pressure vessel

## Special designs

- Press decanter
- Wash decanter
- Screen decanter
- „Over-hung design“ (SBD series)



# TWIN-CONE Decanting centrifuge TWC



## Description

The most important factor in the design of solid bowl centrifuges for mechanical dewatering of fine-grained, non-compressible solids is the residual moisture.

With the TWIN CONE DECANter, the requirements for optimal dehydration were met. The suspension fed in through the inlet pipe is accelerated in a relatively small bowl diameter that is sufficient for the clarification requirements.

The solid matter sedimented in the clarification bowl is pre-thickened in the short cone. The filling volume of the bowl and the length of the dewatering incline is adjustable via the weir overflow for liquid from the bowl.

The pre-thickened solids are transported from the "feed" bowl out of the liquid "sump", through the dewatering zone, and pushed out of the small cone into the significantly larger drying cone.

The solids are "opened" from the initial compression in the "feed" bowl and redistributed here with a low amount of degradation. The worm in the second "drying" cone has a larger capacity between the flights preventing high compaction in this area.

At the same time, the larger diameter of the "drying" cone produces higher G forces at relatively low speeds. The residual moisture separated from the solids is discharged through a second adjustable weir.

If a small amount of solids are carried out with the liquid discharged at this second cone weir, the liquid with any carryover solids can be added back via the feed pipe for additional separation and capture (i.e. the solids are not lost, just recycled).

In the second cone, rinsing of the solids is also possible, and the washing liquid can be kept separate from the feed liquid.

When the TWIN CONE DECANter centrifuge ramps down in speed during shutdown, no liquid carryover into the solids discharge occurs due to the second weir in the "drying" cone.

## Successfully used for:

CPE  
EPS  
Fish meal  
Fish waste water  
Lactose  
Methycellulose  
PE

PMMA  
Polyvinyl alcohol  
PP  
PVC  
SAN  
Sorbic acid





### The 10 major advantages

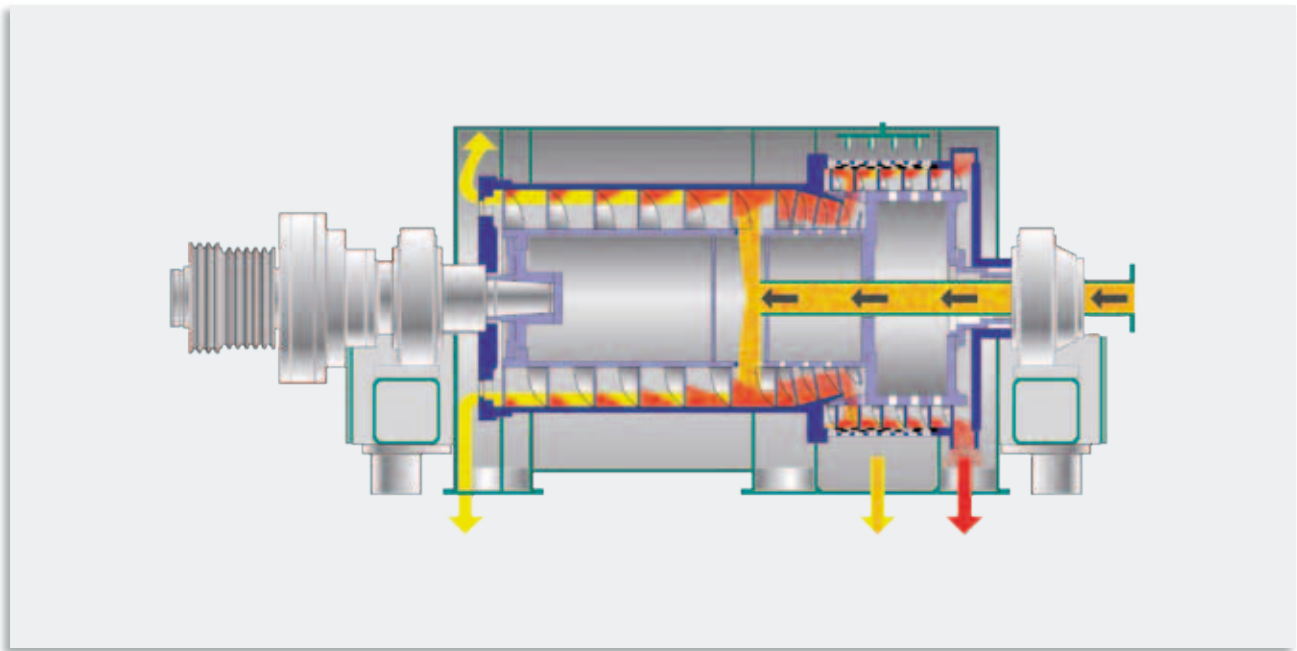
- Clarification and drying in two separately designed and differently proportioned bowl units.
- Separate and therefore optimum adjustments of the sump levels for clarification and drying.
- Solids loading between the worm flights allows for the liquid to escape, eliminating the “pull up” of liquid by an advancing worm design. This allows the use of the proven heavy-duty CYCLO gear drive for the differential speed between the bowl and worm.
- The solids are thickened into a cake in the first cone, then loosened and opened by passing over into the second cone for further dewatering.
- At high solids capacities, the second drying cone provides a larger volume and lower loading between the worm flights.
- No liquid carry-over from the bowl into the solids discharge area during slow down/shut down.
- Optimum removal of residual liquids from the thickened solids cake in the second, higher G force and high volume drying cone.
- The separation of the large liquid loading is achieved in the first smaller bowl. As the diameter is proportional to the square of the required power at a specific acceleration, this results in lower power to drive and significant energy savings.
- Optional washing of the solids is possible in the separate second "drying" cone, with separate discharge of the wash liquid from the original liquid.
- No negative compromise between the clarification and drying.

### Standard frame sizes

Type	TWC	250/360	350/450	450/600	600/750	750/900	800/1000	1000/1200
Drive motor	approx. kW	22	45	90	132	160	200	250
Length	approx. mm	2,500	2,800	3,150	3,350	4,000	4,200	4,600
Width	approx. mm	1,800	1,850	2,300	2,500	2,800	3,000	3,250
Height	approx. mm	920	1,020	1,300	1,500	1,800	1,900	2,100
Weight	approx. kg	1,900	2,650	4,500	7,000	11,500	13,500	18,000

We reserve the right to make any changes required by technical advances.

# TURBO-SCREEN Decanting centrifuge TSD



## Description

The TURBO-SCREEN is one of the most advanced developments in solid/liquid separating technology and has significant design and process advantages over "standard" centrifuge designs.

In screen bowl centrifuges typically used until now, the screen section is connected to the bowl cone at the point of the smallest diameter. The screening section then has the same smaller diameter of this cone.

This design has the disadvantage of restricted volume and a higher solids layer, with reduced G forces, especially in the dewatering section of the centrifuge.

The TURBO SCREEN on the other hand, works in two stages and optimally combines the advantages of the solid bowl centrifuge as well as a screening centrifuge.

In the first stage, the solids are dewatered on the conical part of the solid bowl section. The filling volume of the bowl and thereby the length of the drying incline are adjustable with the weir plate in this section. The clarified liquid is decanted over this weir disc.

The pre-thickened solids are moved over the end of the conical section into the significantly larger screen drum. In this second stage, the solids cake is broken up and redistributed to yield a thinner layer of material due to the larger volume available.

This subjects the solids cake to considerably greater G forces generated by the larger diameter, which enhances the filtration and lowers the residual moisture.

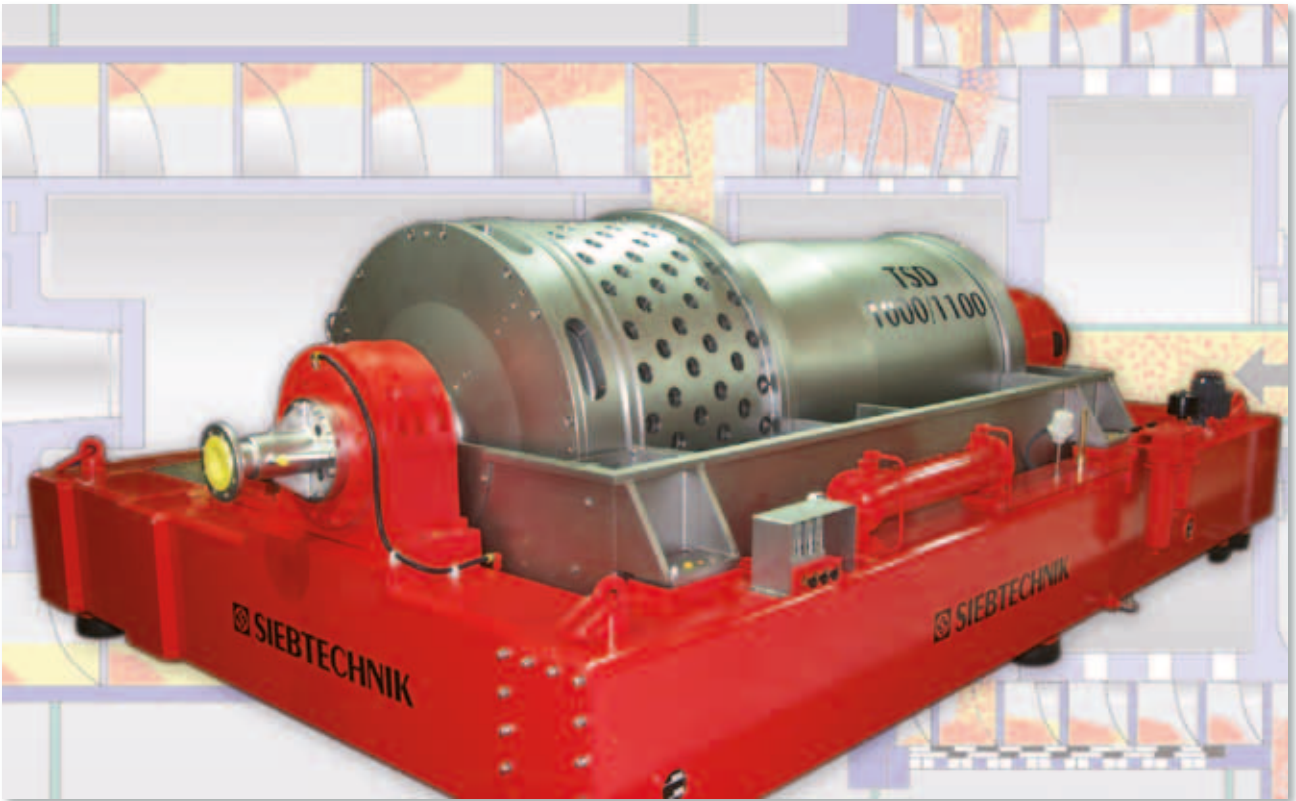
Since only a relatively small amount of liquid reaches the screen part with the prethickened solids, the amount of the fines loss through the screen is low and can be disregarded when recirculated into the centrifuge with the feed.

The generously dimensioned screen drum with a flat layer of solid material is particularly suitable for rinsing purposes. Naturally the washing liquid can be discharged separately from the mother liquor.

## Successfully used for:

Aspirin  
Bisphenol  
CPE  
DMT  
EPS  
Glauber salt  
Granulates  
Isomaltose  
Ketogulon  
Coffee concentrate

Lactose  
MC  
Mixed salt  
PE  
PMMA  
PP  
PVC  
SAN  
Silica gel  
Vitamin C



### The major advantages

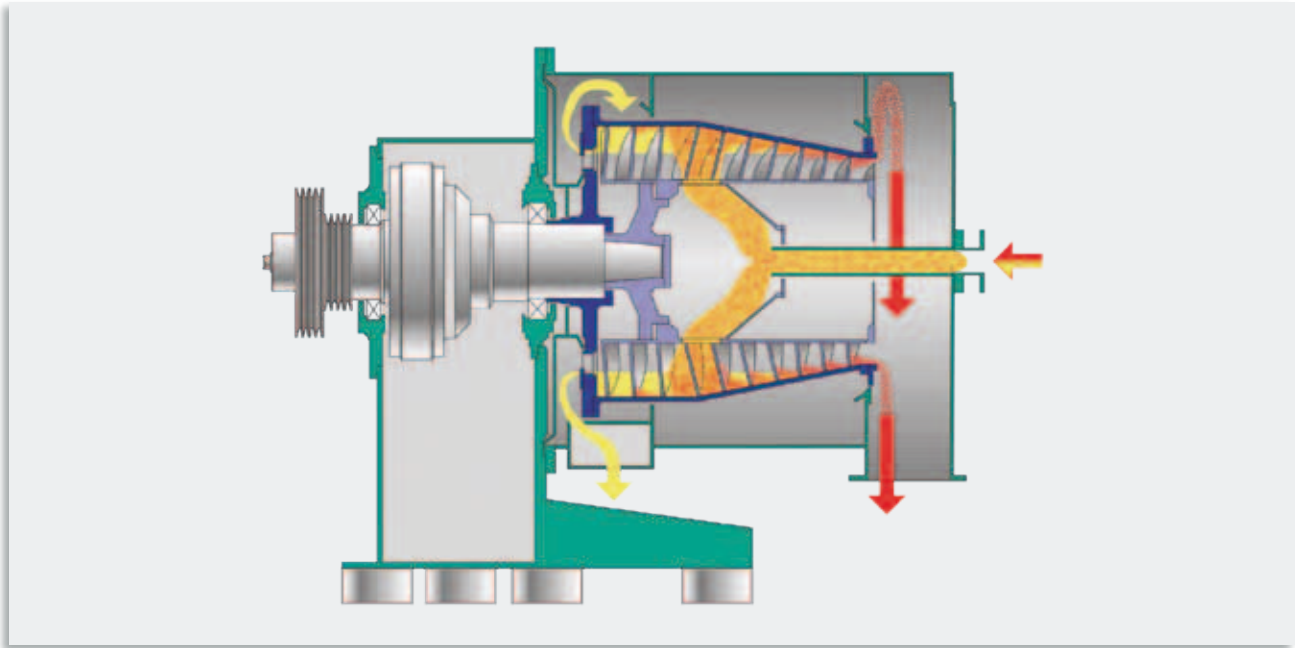
- Clarification and drying in two separately designed work stages.
- No detrimental compromise between clarifying and drying sections.
- Pre-thickening of the solid material with subsequent breaking up of the cake over the end of the conical bowl to the large screen section.
- Even for high solids capacities, the screen drum provides sufficient volume and a thin solids layer.
- Optimum removal of residual moisture from the pre-thickened solids cake in the large-volume screen drum, due to the higher centrifugal force when compared to the clarifying section.
- High yield with minimum loss of solids and recirculation of the separated liquid.
- Efficient rinsing on a separate screen drum at high centrifugal forces.
- Separate draining and discharge of the wash liquid and the mother liquid.

### Standard frame sizes

Type	TSD	250/360	350/450	450/600	600/750	750/900	800/1000	1000/1200
Drive motor	approx. kW	22	45	90	132	160	200	250
Length	approx. mm	2,500	2,800	3,150	3,350	4,000	4,200	4,600
Width	approx. mm	1,800	1,850	2,300	2,500	2,800	3,000	3,250
Height	approx. mm	920	1,020	1,300	1,500	1,800	1,900	2,100
Weight	approx. kg	1,900	2,650	4,500	7,000	11,500	13,500	18,000

We reserve the right to make any changes required by technical advances.

# SHORT-BOWL Decanting centrifuge SBD



## Description

In this solid bowl centrifuge the rotating parts have the advantage of a single bearing overhung design. This also means the rotating assembly ends at the partition that separates the dry area from the process area of the centrifuge, which ensures open and free release of the solids from the product housing.

The SHORT BOWL can separate fine solids if the specific density difference is great when compared to the carrier liquid. It is also used for solids of adequate particle size and settling rate within the available residence time in the machine. The short design has been used successfully for classification of some solids also.

In spite of the relatively short solid bowl, the SBD is a high performance continuously operating centrifuge yielding good separation results for the appropriate applications.

To separate the solids from the liquid, the suspension is fed via the inlet pipe into the feed cone of the worm body. From there the slurry passes through openings to the centrifuge bowl where it is accelerated to the rotational speed of the machine. Under centrifugal forces, the solids form sediment on the inside surface of the bowl and are transported to the discharge end of the conical area by the worm.

The filling volume in the cylindrical part of the bowl and the length of the drying area in the conical part is set via an adjustable weir disc.

The correct ratio of the clarification and drying areas are product and application specific. These must be determined with preliminary testing and operation. This design is especially useful for food products which require thorough equipment cleaning (CIP available), high-temperature work or with pressure-tight processes.

## Successfully used for:

Aluminium powder  
Animal meal  
Barium carbonate  
Fish meal  
Graphite  
Iron slurry  
Lactose  
Magnesium sulfate  
Melamine  
Molybdenum salt

Nickel hydroxide  
Phosphates  
Plaster  
Potassium fluoride  
Residue slurry  
Silver nitrate  
Sodium iodide  
Zinc oxide  
Zirconium oxide



### Standard frame sizes

Type	SBD	140	210	250	300	350	450	600	750	900
Drive motor	approx. kW	3	5.5	7.5	11	15	22	45	75	110
Length	approx. mm	855	1,110	1,195	1,250	1,635	1,750	2,150	2,550	3,010
Width	approx. mm	760	1,000	1,200	1,220	1,550	1,600	2,100	2,250	2,600
Height	approx. mm	515	700	776	845	1,015	1,100	1,560	1,750	1,950
Weight	approx. kg	220	415	850	1,300	1,930	2,200	4,500	7,000	8,200

We reserve the right to make any changes required by technical advances.

## CENTRIFLEX Laboratory centrifuge



### Description

The SIEBTECHNIK laboratory centrifuge CENTRIFLEX is a universal centrifuge for examining separation possibilities of solid/liquid mixtures under the influence of high centrifugal forces.

The comprehensive equipment accessories allow versatile applications such as filtration, washing, rinsing, clarifying and continuous separation of two liquids as well as preparation of emulsions.

When used as beaker centrifuge, it can be equipped with full beakers and glass inserts to enable sedimentation tests.

The centrifuge can also be equipped with filter beakers to examine the filtering behaviour of products with different filtering media. The CENTRIFLEX can also be used to separate small batches of suspensions.

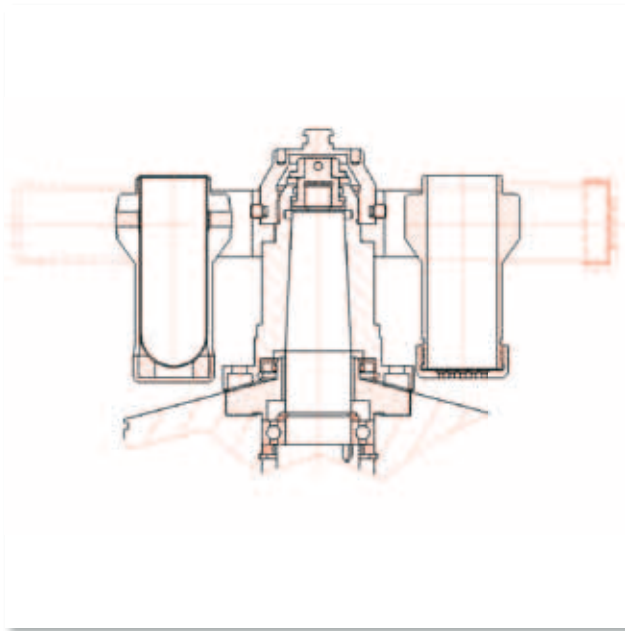
The CENTRIFLEX is designed as a stand-alone unit for user-friendly operation. The recess at the housing front provides a protected storage area for collection containers of filtrates and concentrates.

The centrifuge is operated via a touch-screen control panel with digital display of the speed, centrifuging time and the operating status. The operator can select between automatic mode and manual mode with timer.

The CENTRIFLEX is accelerated instantly to the operating speed selected and electrically driven until braked and stopped. Here, smooth ramp up or rapid stop is possible. The automatic stop feature enables exact centrifuge times to be attained.

With the electronic controls supplied, the unit allows flexible or specific operation required to analyze any separation problem. It also provides the ability to simulate existing or proposed operating parameters.





## Beaker centrifuge

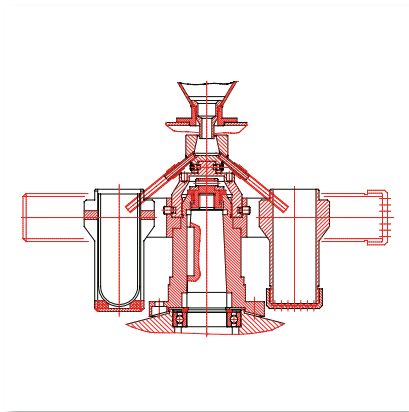
As a full beaker centrifuge, it is used for sedimentation of small suspension samples.

The bottle holder carries 2 or 4 bottles each with 100 cm<sup>3</sup> volume.

The bottle holder can also be equipped with filtering beakers. This allows filtration tests to be conducted to determine residual moisture.

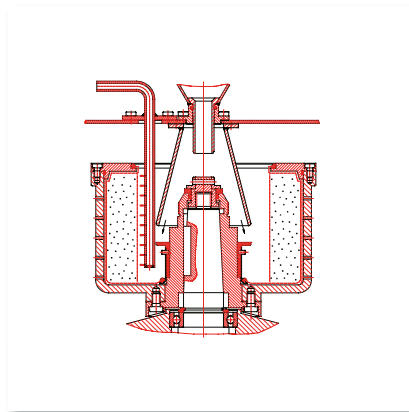
The following filter media can be inserted into the beakers

- Filter paper
- CONIDUR® slit discs
- Laser hole discs
- Wedge-wire plates



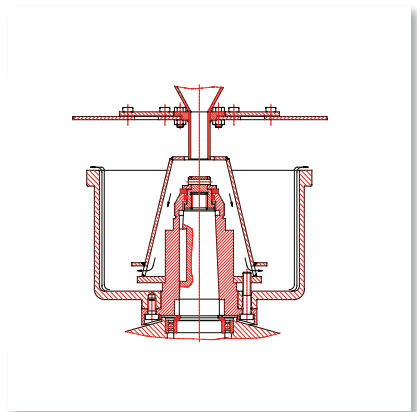
### Beaker centrifuge (bottle centrifuge) with rotating feeder system

When used with beakers, the centrifuge can be equipped with a rotating feeder system to fill the beakers during operation. Washing tests can also be conducted if the filtration beaker inserts are used.



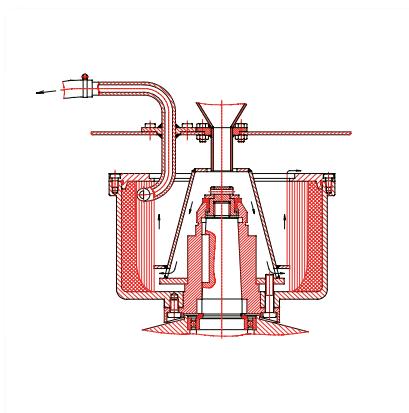
### Screening centrifuge with washing pipe

The screening centrifuge can be used to separate solids from liquids. The drum for this purpose is fitted with a wire-cloth inlay and a filter bag. CONIDUR®, laser or wedgewire screen inserts can also be used. Once the liquids have been centrifuged, the solids cake can be washed with a rinsing pipe, or neutralized as well.



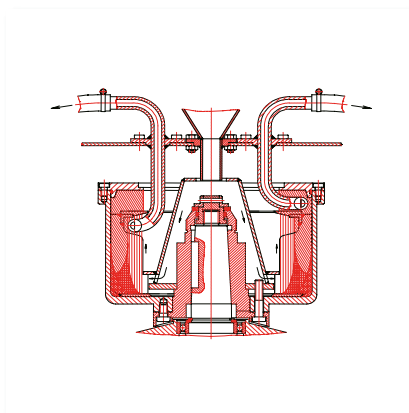
### Emulsifying centrifuge

As an emulsifying centrifuge, it produces emulsions from two or more liquids. With the action of centrifugal force, the liquid mixture pours over the edge of the drum in a very thin layer and is centrifuged against the wall of the collecting housing at high speed. The stability of the emulsion can be increased, when required, by a repeated feeding and collection.



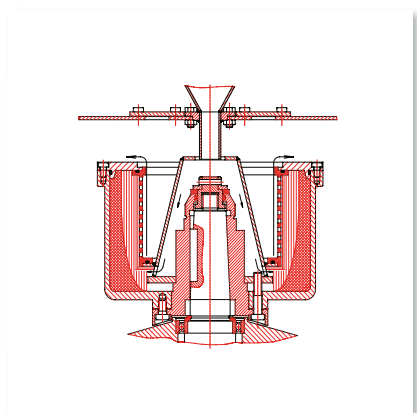
### Solid bowl centrifuge with overflow weir, with or without peeling tube

As a sedimentation centrifuge, it has a wide range of applications for clarifying liquids, especially when the solids do not settle easily and require extended centrifuging times. The liquid floating to the surface can be discharged through a peeling tube after the solids sedimentation. Without the peeler tube, the solid bowl can also be used as an overflow centrifuge for decanting liquids.



### Separator centrifuge with two peeling tubes (3-phase separation)

In this arrangement, it separates two liquids of different densities, while the solid matter is deposited on the bottom of the drum. The two liquid phases are separated independent of each other and discharged continuously.



### Internal filter centrifuge

If an internal filter insert is used, the liquids can be separated from heavier or lighter solids by filtration from the outer filling area to the inside overflow through the filter. Its main field of application is the filtration of sludges, which under normal conditions, form a tight, impermeable filter cake.

# Delivery Program

## Screening Machines Process Equipment

circular and elliptical motion screens  
double counterweight screens  
multideck horizontal screen  
round screens  
jigs

## Sampling Systems, Airtube Systems, Size Reduction Machines, Laboratory Equipment, Control Screening Machines and Automation

individual units and complete installations  
for sampling and sample preparation  
airtube systems  
jaw crushers  
roller mills  
hammer and hammer impact mills  
eccentric-vibrating mills and ball mills  
control screening machines  
analytical screening machines  
splitter  
testing drums  
automation

## Centrifuges

scroll-screen centrifuges  
pusher centrifuges  
sliding discharge centrifuges  
vibratory centrifuges  
decanter centrifuges