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GENTLE HANDLING
PULL ACTION FILTER CENTRIFUGES

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FERRUM MORE THAN 100 YEARS SINCE 1917

APPLICATIONS+
SPECIFIC DESIGNS

CHEMICAL INDUSTRY

FINECHEMICAL INDUSTRY

PHARMACEUTICAL INDUSTRY

FOOD INDUSTRY

MINERAL INDUSTRY

CUSTOMISED SOLUTIONS

Ferrum supplies innovative customised and special designs for a very wide range of applications and processes.

One such solution is the patented Pull Action Filter centrifuge which features a unique pneumatically operated pull device to discharge the solids out of the centrifuge without the use of a scraper knife.

PULL ACTION FILTER CENTRIFUGES TYPE DZF

The DZF type Pull Action Filter centrifuges (vertical bottom discharge centrifuge) work discontinuously, the solids are discharged vertically downwards.

The unique pull action filter discharge system is a Ferrum innovation (patented) and functions without using a scraper knife making it the ideal solution for products sensitive to crystal breakage and/or with thixotropic behaviour.

With the specially designed pneumatically driven pull mechanism the filter cloth is stretched downwards, releasing the product from the filter cloth which then falls vertically downwards out of the centrifuge.

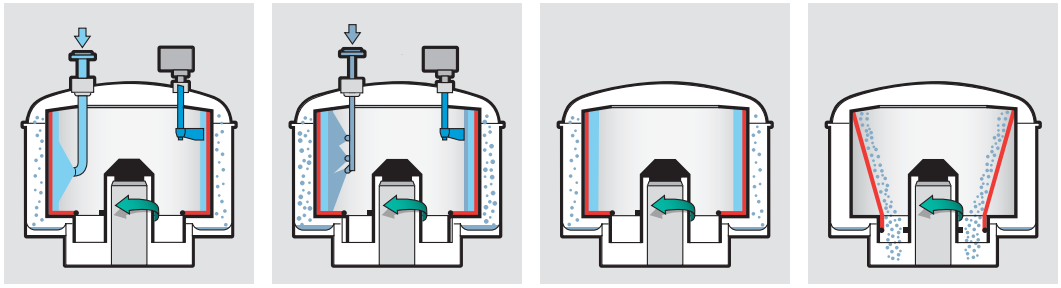
DESIGN FEATURES

- Robust and reliable design in accordance with the latest standards, directives and GMP requirements
- Product discharge without scraper knife
- Gentle product treatment - no crystal breakage
- No residual heel since this is also removed by stretching the filter cloth
- Optimally designed functional parts for efficient and reliable process cycles with low vibration
- Suitable for Ex zone 1 (according to Directive 2014/34/EC)
- The filter cloth is only stretched for discharging, not inverted. Therefore, the mechanical strain on the filter cloth is comparatively small.
- The discharge sequence is carried out within the basket, the centrifuge housing remains free from centrifuged product.
- Dimensions and weight are significantly smaller than for a comparable horizontal filter centrifuge.
- Less expensive than a comparable horizontal centrifuge with inverting filter cloth mechanism.
- Easy maintenance due to modular design

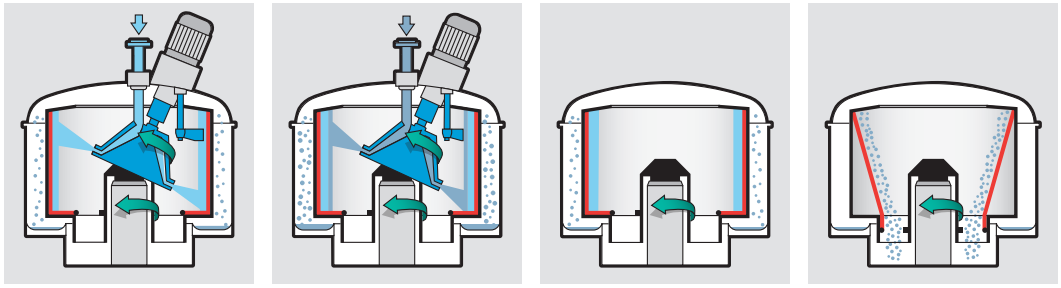
PULL ACTION FILTER CENTRIFUGES
PRINCIPLE OF OPERATION

Highest efficiency | The solid-liquid separation with the Pull Action Filter centrifuge is effected discontinuously in a sequence of specific process steps. The individual process steps last from a few minutes to several hours depending on the characteristics of the product. Depending on the type of control system, the process can be fully automatic, semi-automatic or manual.

Filling and intermediate centrifugation | **Washing** | **Centrifugation** | **Solids discharge**



Basic design: feed pipe and wash pipe



Design with feed and wash disk

Filling

The suspension is applied evenly to the centrifuge basket via the feed pipe or optionally via the feed disk. The fill level control prevents overfilling of the basket.

Intermediate centrifugation

The Pull Action Filter centrifuge accelerates to centrifuge the liquid from the surface of the cake.

Washing

After intermediate centrifugation, the wash liquid is applied evenly to the product cake; this liquid enters the centrifuge via the feed disk or the wash pipe.

Centrifugation

After washing, centrifugation takes place - until the required residual moisture content of the filter cake is achieved.

Solids discharge

At reduced speed, sometimes at standstill, the pneumatically activated pull mechanism stretches the filter cloth downwards. This releases the product from the filter cloth, which then falls vertically downwards out of the centrifuge.

CIP AND SIP SYSTEMS
PURE AND CLEAN

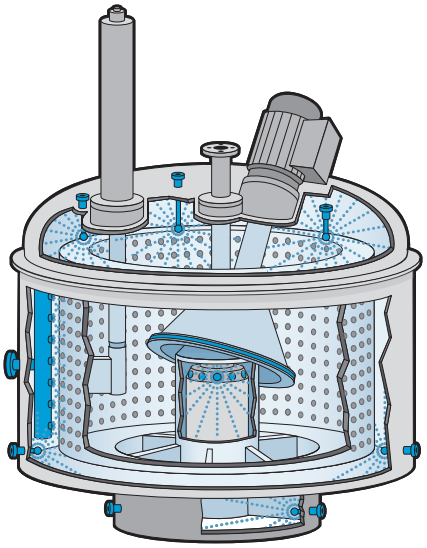
CIP system | For cleaning the centrifuge process area, a CIP system (Cleaning In Place) can be integrated in all our vertical centrifuges. This system is used during a product or batch change to eliminate the risk of cross-contamination. The CIP nozzles, the feed and wash system as well as the residual heel removal outside the basket can be used to clean the process area.

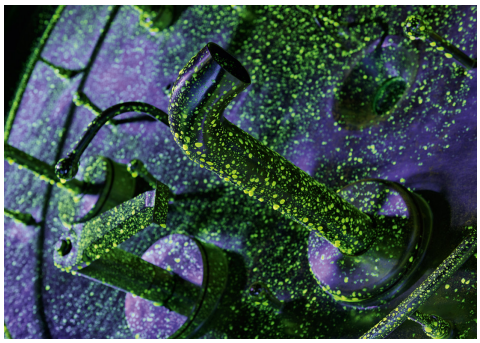
SIP system | After the CIP cleaning, SIP cleaning (Sterilisation In Place) can be undertaken. To kill microorganisms, the process area is wetted with disinfectant (e.g. hydrogen peroxide, sodium hydroxide, etc.) via the CIP system.

Optional flooding of the process area | The centrifuge can be flooded with CIP liquid to just below the cover. This process permits contact between the cleaning liquid and the soiled surfaces for as long as required and therefore maximum effect.

GMP design for efficient cleaning | Our designs comply with the latest GMP guidelines. The hygienic cleaning of the process area is made possible by a clean finish, excellent surface quality, compliance with minimum radii and the use of FDA-approved open O-rings.

Low solvent consumption | The compact design as well as optimised cleaning programs ensure efficient cleaning with low solvent consumption.





Riboflavin Test - before CIP

VERIFIABLE CLEANNESS

We optimise the CIP programs for the different centrifuge types with the aid of riboflavin tests. This way it is ensured that even with low solvent consumption, all surfaces in the process area are wetted with cleaning liquid. Riboflavin tests can be demonstrated on request during the FAT (Factory Acceptance Test).

Riboflavin Test - after CIP

AUTOMATION SYSTEMS
RELIABLE CONTROL

Automation of centrifuges is of central importance to Ferrum. Ferrum has invested many years into the development of centrifuge automation systems. Proven, standardised hardware and software modules are used as a basis and are supplemented with customer specific elements.

OVERVIEW OF THE RANGE OF CONTROL SYSTEMS AND DRIVES

+ Safety analyses, safety circuits
+ Automation of the process, software programming
+ Design and installation of cabinets for control systems and drives, as well as operator panels
+ Sensors and monitoring equipment
+ Connection to distributed control systems, remote maintenance
+ Explosion protection up to Ex zone 1 (according to Directive 94/9/EC)
+ Documentation: diagrams, concept descriptions, operating instructions, safety certificates, etc.
+ Commissioning of complete systems on-site

DRIVE SYSTEMS AND SAFETY CONTROL SYSTEMS

Our drive systems and safety control systems guarantee a safe and optimised operation of the centrifuge. The systems are state of the art. They are continuously developed and adapted to our risk analyses as well as to the latest directives and standards.

Frequency converters of the latest generation with integrated safety functions are used to control the speed.

CONTROL SYSTEMS AND TERMINALS TO FACILITATE EASE OF USE

The control and visualisation software permits easy operation and control of the solid-liquid separation process. Thanks to our extensive range of different control systems, operator panels and components from leading suppliers, we efficiently implement comprehensive customer requirements.

Ferrum can supply operator panels for fully automatic and visualised process control systems with integrated safety functions which can be controlled by a safety control system.

The centrifuge can be operated in an automatic, semi-automatic, manual or service mode. A wide range of production recipes can be saved in an easy-to-use recipe management system.

Terminal with process visualisation for Ex zone 1

Terminal with process visualisation for Ex zone 2

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WORLDWIDE

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