



SEPARATION

MINIMUM FOOTPRINT MEETS HIGHEST EFFICIENCY

KRAUSS-MAFFEI
VERTICAL CENTRIFUGE VZU

ANDRITZ

ENGINEERED SUCCESS

Specialist for high-quality products

The Krauss-Maffei vertical basket centrifuge VZU has been specifically designed for processing high-quality products in the chemical, pharmaceutical, and food industries.

The requirements established for minimum product loss, such as optimal cleaning ability, minimum dead zone design, and inspection capability, are all fulfilled in this development. Operating benefits include flexibility to adapt to a wide variety of product requirements, effective and even filling, intensive solids washing, and optimized solids discharge. In addition, the vibration damping system developed for this unit using four column supports results in smooth operation and minimal downtime for maintenance.

MAIN APPLICATIONS

- Amino acids
- Agrochemicals
- Fine and special chemicals
- Pharmaceutical products (e.g. API and antibiotics)
- Vitamins
- Food products

MATERIALS OF CONSTRUCTION

- Various grades of stainless steel
- Nickel-based alloys
- Special metals with or without lining

PROCESSING PARAMETERS

Operation	Batch-type filtration or sedimentation
Basket diameter	1,000, 1,250 mm
Basket volume	250-500 l
Filter area	2.0-3.2 m ²
Solids content	From 3 % by wt.
Average particle size	5-500 µm
Washing efficiency	Excellent
Solids recovery	Almost 100%



Krauss-Maffei vertical peeler centrifuge, VZU 1250



Solids discharge outlet

Process advantages

SIMPLE ASSEMBLY AND MAINTENANCE

Machines are delivered fully assembled and equipped with quick-action closure rings and hydraulically operated cover hinge. Housing cover opens fully.

EFFICIENT PRODUCT DISCHARGE

High yields are ensured due to the optimized discharge geometry and pneumatic residual heel removal.

MINIMUM PRODUCT LOSS

Design contains a minimum of installed parts. Nitrogen supply for residual heel removal is integrated into the scraper arm. Open design for solids discharge.

HOMOGENEOUS PRODUCT DISTRIBUTION

Product distribution independent of the slurry concentration and flow rate, using the dynamic feed system.

RESULT-ORIENTED MACHINE CONTROL

Continuous measurement of:

- Filtration resistance
- Feed level
- Filtration performance
- Submersion point of the liquid

REDUCED SPACE REQUIREMENT

Due to the improved machine geometry on the one hand and the vertical filtrate discharge on the other hand, less floor space is required. This allows a simpler and more space-saving arrangement of the filtrate discharge pipes.

CLEANING-IN-PLACE (CIP)

When changing the product, the equipment has to be thoroughly cleaned so that there can be no contamination between the product batches. Users require fully automatic cleaning with verifiable cleaning effect. ANDRITZ develops an effective CIP program in cooperation with the operators and users. This generally comprises:

Pre-cleaning:

In a first step, the solvent is fed in through the cleaning nozzles at reduced speed.

Main cleaning:

All discharge pipes from the centrifuge are closed. The centrifuge is filled with solvent. The speed and the direction of rotation vary according to a defined program. As a result of this "washing machine effect", the machine is cleaned efficiently.

Final cleaning:

The machine is rinsed again by the cleaning nozzles.

Operation

Advancements in control and instrumentation enable enhanced flexible and result-oriented operation of discontinuous filter centrifuges. In applications in the chemical and pharmaceutical industries, the individual cycle times for feeding, filtering, washing, and peeling vary from just 3 minutes to several hours. The individual process steps are adjusted flexibly to the existing processing conditions.

FEEDING

During the feed process, the slurry is fed into the centrifuge basket through the feed distributor. This usually takes place in several stages so that the slurry does not flow over the basket rim. The feed level is measured by a feed controller. This determines the filling level by a mechanical or contact-free method. Usually the basket is filled up to approx. 75-85% of the height of the basket rim. The process is completed when the filter cake has attained the desired height. The special feature of Krauss-Maffei vertical basket centrifuges is the dynamic feed system developed by ANDRITZ. The advantage of this system is that it compensates for fluctuating flow rates and concentrations. It is also possible to use conventional feed pipes as an option.

FILTRATION

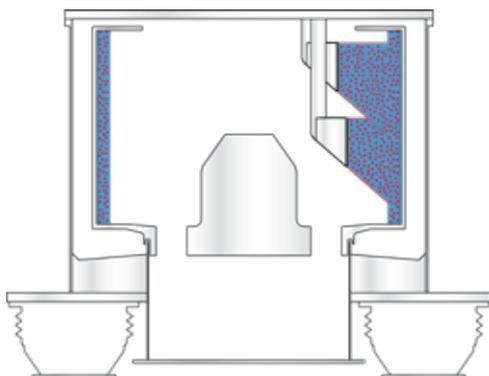
The main filtration process takes place concurrently with the feeding step. It is completed when the slurry submerges into the filter cake.

WASHING

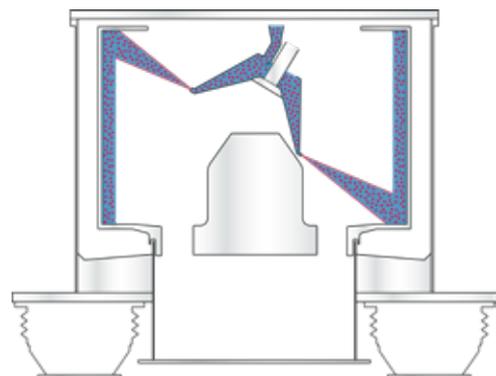
After the main filtration process, the cake is often washed once or several times. For this purpose, a wash liquid is fed into the basket through the feed pipe or, if washing conditions are not good, through a wash pipe. The level of the wash liquid is controlled by the feed controller in the same way as in the feed process. Wash filtration is completed when the wash liquid has submerged into the filter cake.

DRY SPINNING

After completion of the washing procedure, the centrifuge is accelerated to full speed. The spinning process continues until the desired residual moisture content is obtained in the filter cake.



Feeding with static nozzle



Feeding with rotating distributor

PEELING

At the beginning of the peeling procedure, the centrifuge basket is reduced to the required speed. The peeler knife moves radially into the filter cake and peels off the cake. In order to achieve peeling over the entire height of the basket, the peeler knife is moved downwards axially. The peeling device then moves in again to clean the bottom of the basket. The filter cake removed drops directly into the solids shaft, which extends across almost the entire circumference of the lower basket surface. Plugging and caking are minimized with this design.

RESIDUAL HEEL REMOVAL

In order to protect the filter media, a thin layer of filter cake remains in the filter basket. This layer is called the residual heel and is used as an additional filter medium. The residual heel is removed pneumatically by the peeling device using compressed nitrogen. A further special feature of Krauss-Maffei vertical peeler centrifuges: The nitrogen is fed in through the shaft of the peeling device. This ensures that there are no hoses in the process area.

MAINTENANCE

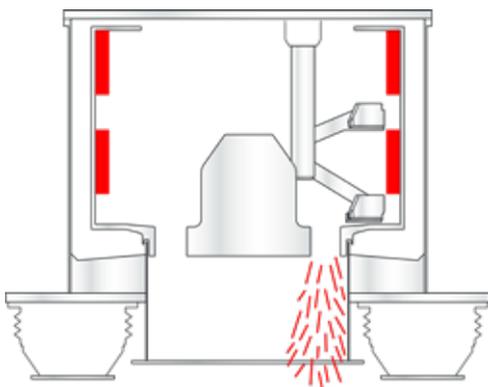
The Krauss-Maffei vertical peeler centrifuge VZU has been designed to make operation and maintenance easy. The primary goal is to keep operating and maintenance costs down.

BEARING CARTRIDGE

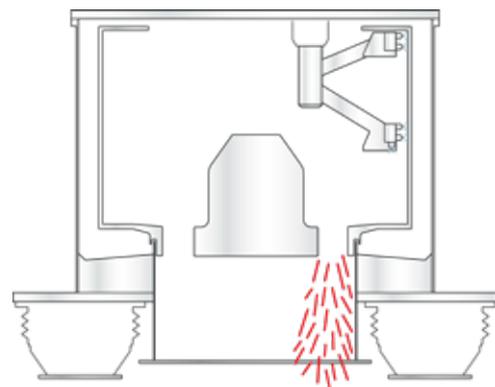
The bearings and main shaft assembly can be removed easily as a single unit, thus the bearings can be replaced in a remote maintenance shop instead of on the production platform.

SHAFT SEAL

The shaft seal has a cartridge design for easy assembly and disassembly. If only the shaft seals need replacement, the old seal can be removed and replaced without having to dismount the shaft and bearing.



Peeling



Residual heel removal

Result-oriented controls

In order to deal with frequent product changes, Krauss-Maffei vertical peeler centrifuges are equipped with appropriate measurement and control systems.

The following parameters are measured continuously: Filling level in the basket, filtration speed and submersion point of the liquid into the filter cake. The values measured are analyzed by the control electronics, and the process parameters, such as feed time, dry spinning time, wash time, and so on, are adapted to optimum benefit. The unit is controlled on a result-oriented basis. For optimized feed level detection, ANDRITZ recommends the following feed controller:

CONTACT-FREE MEASUREMENT

As an option, ANDRITZ KMPT recommends contact-free measuring systems based on radar. A radar sensor emits a measuring signal in the direction of the charge in the basket. The radar signal reflected by the charge is picked up by a sensor and evaluated by the control electronics.

YOUR BENEFITS

- Avoids splashing and caking thanks to contact-free measurement
- Analog and continuous level detection of the liquid and the cake height
- Analog value can be stored electronically
- No mechanical adjustments at machine, feed height is determined in process parameter recipe
- No wear on the sensor, thus no contamination of the product with metal abrasion



Contact-free measurement

Intelligence for machine and process control

Metris addIQ control systems

With Metris addIQ, you get a well-proven, intelligent control solution for industrial processes and machines. Our solid/liquid separation specialists use their in-depth expertise to provide scalable solutions that are individually tailored to regional and application requirements. Whether you're automating new equipment or upgrading to extend the lifecycle of existing systems, we find the ideal solution for you.

Our tailored turnkey systems from a single supplier can improve entire plants or individual machines. By providing state-of-the-art automation technologies and digitalization, we ensure best-in-class performance. Automating machine and plant equipment measurably reduces gaps in many different production process steps. By using automation from ANDRITZ, you can reduce downtime thanks to features such as predictive analysis that allow you to optimize productivity.

Metris addIQ covers all levels of automation, starting at basic automation (machine, process, and plant control), to upgrades, and add-ons for process optimization. Together, you get a full range of optimized solutions that help reduce maintenance efforts and ensure preventive service for your machines and plants. These are all delivered from a single source and always individually tailored to your business demands. Metris addIQ control systems are part of the ANDRITZ brand for Digital IIoT (Industrial Internet of Things) Solutions.



Foundation and installation

Rotation of a centrifuge basket not only generates the centrifugal forces necessary to separate solids from liquids, but also high dynamic forces due to the acceleration of substantial masses, such as the weight of the basket and its filling with product.

Uneven distribution of the product inside the basket creates imbalance forces that are transmitted to the structure supporting the centrifuge. In order to keep the dynamic forces acting on the structure to a minimum, the centrifuge is best mounted on a damping system supported by spring and damper elements.

IMPORTANT INSTALLATION CRITERIA

- The feed pressure should be around 0.5 bar.
- Keep all supply and discharge lines short and with a maximum possible gradient.
- All attachments to the centrifuge must be flexible.
- Provide for fast draining of all pipes either by venting or pressure compensation in closed loop systems.
- Install sight glasses and sample ports in all supply and discharge lines.
- Provide vertical solids drop without cross-sectional restrictions.



Typical installation of two vertical centrifuges VZU 1250

Technical data

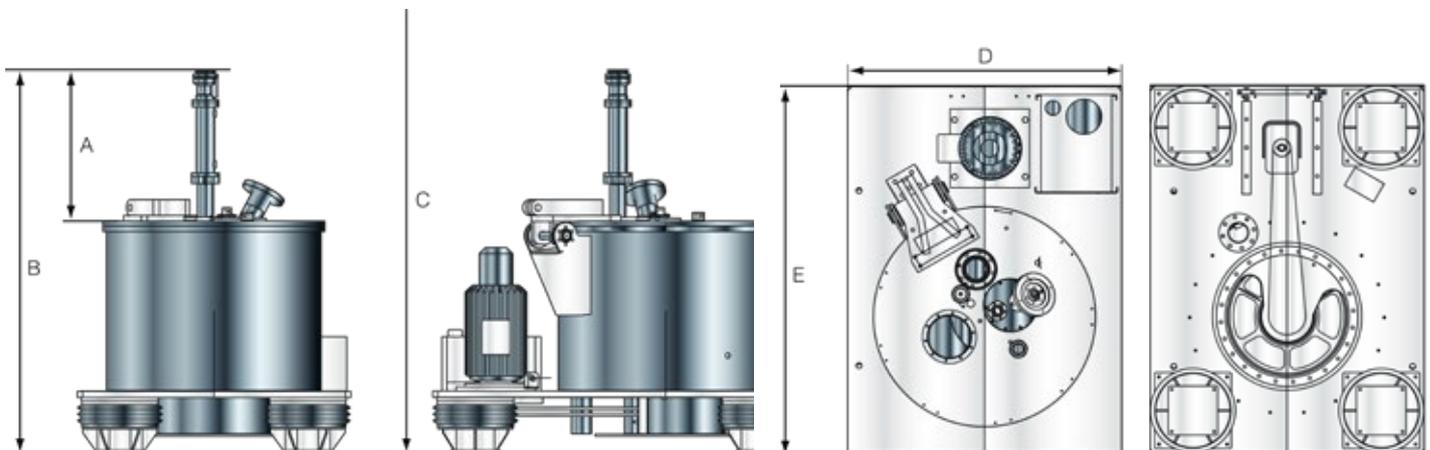
DIMENSIONS AND WEIGHTS

Centrifuge model	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	Weight [kg]
VZU 1000/2.0	940	2,250	2,620	1,550	2,100	3,800
VZU 1250/3.2	1,200	2,720	3,100	1,750	2,380	7,500

TECHNICAL DATA

Centrifuge model	Basket inside diameter [mm]	Basket length [mm]	Basket volume [mm]	Filter area [m ²]	Max. g-force ¹⁾ [-]	Max. speed [rpm]
VZU 1000/2.0	1,000	630	250	2.0	870	1,250
VZU 1250/3.2	1,250	800	500	3.2	630	950

1) Basis: Density of saturated filter cake 1,250 kg/m³ at T=50°C
 All technical data are approximate and subject to change without notice.





Test our lab: we're all about finding the optimum solutions for your processes

ANDRITZ Separation operates fully equipped test centers in close vicinity to its customers, offering both lab-scale and pilot-scale equipment.

Our experienced separation specialists will advise you in order to determine suitable technologies from our wide portfolio that are most appropriate for your product. We also include the upstream and downstream process tasks in our considerations and evaluate single-step or multiple-step process solutions, typically trying to reduce the number of subsequent unit operations. In a first set of lab-scale trials, these technologies will be compared in an unbiased and independent review. Then, a second set of larger-scale tests will determine in detail the process parameters needed to optimize the operating conditions in your process.

We will provide a complete report recommending the best solution for your solid/liquid separation process, including scale-up information for the production equipment. Process warranties can be provided, even for new products. In addition, we can assist you in running long-term trials at your site with equipment from our rental machine pool.

What's your separation challenge?

ASK YOUR
SEPARATION
SPECIALIST





Your full-service provider

With ANDRITZ Separation, you gain access to one of the world's largest OEM manufacturers for solid/liquid separation systems, including such well-known brands as 3Sys Technologies, Bird, Delkor Capital Equipment (Pty) Ltd., Escher Wyss dryers, Frautech, Guinard Centrifugation, KHD Humboldt Wedag, Krauss-Maffei centrifuges, dryers, and filters, Lenser, Netzsch Filtration, Rittershaus & Blecher, Royal GMF Gouda, Sprout Bauer, and Vandenbroek.

Whether you need spare parts, rentals, local service, repairs, upgrades, or modernization of your equipment, ANDRITZ Separation is your true full-service provider. From initial consulting through to service agreements, process optimization, and training programs, we are always looking for ways to minimize downtime and increase predictability in operations while raising your overall production efficiency. Wherever you operate, our network of 550 service specialists and global service centers ensures we'll always be there to support you for many life cycles to come. Let's sit down and see how we could take your operations to the next level.



LOCAL SUPPORT

Responsive local service centers and field service technicians



REPAIRS & UPGRADES

Optimization of machine and process performance, repair work, retrofitting, and modernization



SECOND-HAND & RENTALS

Certified second-hand and rental machines



TRAINING

Operator training and tailored seminars for operating and maintenance personnel



OEM SPARE PARTS

Filter cloths, spare and wear parts from OEMs or with OEM level quality, all readily available



SERVICE AGREEMENTS

Preventive maintenance, contracts for spare parts, maintenance, inspections, repairs, upgrades, operation, and equipment monitoring



PROCESS OPTIMIZATION

Automation tools and process expertise to boost your profit



LAB AND ON-SITE TESTS

Lab and testing capabilities for process optimization and machine upgrades





WHAT'S YOUR SEPARATION CHALLENGE?

ANDRITZ Separation is the world's leading separation specialist with the broadest technology portfolio and more than 2,000 specialists in 40 countries. For more than 150 years, we have been a driving force in the evolution of separation solutions and services for industries ranging from environment to food, chemicals, and mining & minerals. As the OEM for many of the world's leading brands, we have the solutions and services to transform your business to meet tomorrow's changing demands – wherever you are and whatever your separation challenge. **Ask your separation specialist!**

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