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SEPARATION

**BATCH-OPERATED
FILTRATION CENTRIFUGE**

**KRAUSS-MAFFEI
PEELER CENTRIFUGE HZ**

ANDRITZ

ENGINEERED SUCCESS

Krauss-Maffei horizontal peeler centrifuges are batch-operated filtration centrifuges known for their reliable performance at high capacities. They are used in many processes, primarily in the bulk chemicals, fine chemicals, and food industries.



Krauss-Maffei peeler centrifuge HZ - maximum filtration efficiency

The horizontal rotor assembly is cantilevermounted and, depending on the application, can be provided with a conventional filtration basket or a specially designed rotary siphon basket. A fully opening housing door provides access to the basket and all process components for maintenance. Adding variable speed drives and customtailored controls and instrumentation enables the peeler centrifuge to be optimally adapted to a multitude of processing requirements for peak performance.

MAIN APPLICATIONS

Bulk chemicals

Petrochemical intermediates, fertilizers, chlorides, sulfates, calcium compounds, sodium compounds

Fine chemicals

Aluminum fluoride, amino acids, bleaching agents, surfactants, herbicides, pesticides, catalysts, dyestuffs

Pharmaceuticals/related

APIs, vitamins, salicylic acid, citric acid, ascorbic acid, calcium citrate, antibiotics

Plastics/related

ABS, resins, melamine, PE, PP, antioxidant agents

Foodstuff/related

Native and modified starches, artificial sweeteners, vanillin, caffeine

CONSTRUCTION MATERIALS FOR PROCESS-WETTED PARTS

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

PROCESSING PARAMETERS

Average particle size	2-500 µm
Feed solids concentration	From 3.0% by wt.
Solids throughput	Up to 15 t/h



Krauss-Maffei peeler centrifuge, HZ 125/3.2 Si

Process advantages

KRAUSS-MAFFEI PEELER CENTRIFUGES WITH ROTARY SIPHON

By utilizing the rotary siphon feature, an original ANDRITZ development, the overall performance of the peeler centrifuge can be improved considerably. Substantial advantages include:

INCREASED FILTRATION CAPACITY

Creating a vacuum beneath the filter cloth increases the filtration pressure and boosts the filtration rate.

SUPERIOR PRODUCT PURITY

The filtration rate can be adjusted to prolong the contact time between wash liquid and solids to produce a purer cake.

EXTENDED RESIDUAL HEEL SERVICE LIFE

Regeneration of the residual heel is achieved by means of backwashing through the filter medium.

SMOOTHER OPERATION

As a result of backwashing and throttling of the filtration rate, the siphon feature enables feeding into a liquid pool to achieve uniform distribution of solids without vibration, even with fast-filtering products.

YOUR BENEFITS

- Krauss-Maffei peeler centrifuges can be adapted easily to changing process requirements. Different control recipes can be used to select the optimum operating speed and cycle sequence to yield the highest product quality at peak capacity.
- Lower residual cake moisture due to high centrifugal forces
- Adjusted to your product
- Excellent wash results due to even distribution of wash liquid, achieved with a horizontal basket configuration and feed via distributor or spray bars



Krauss-Maffei peeler centrifuge, HZ 160 for starch application

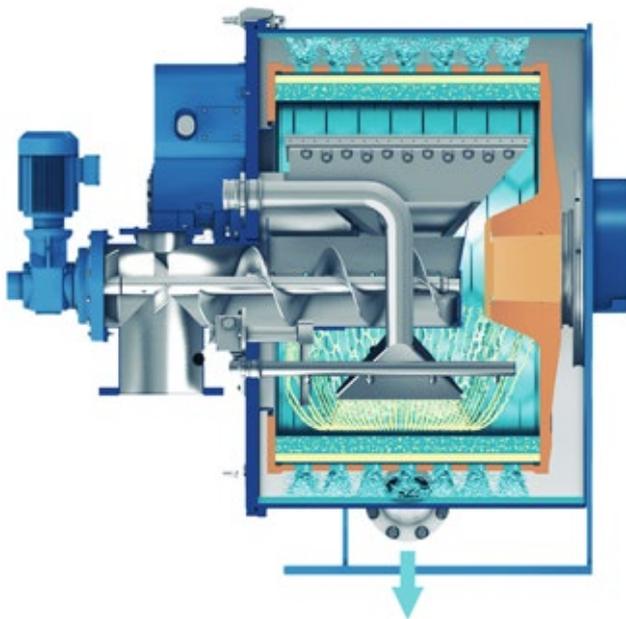


Basket designs

Krauss-Maffei peeler centrifuges are equipped with various basket designs. The versions most frequently applied are the conventional filtration basket and the rotary siphon basket, an original ANDRITZ development.

FILTRATION BASKET

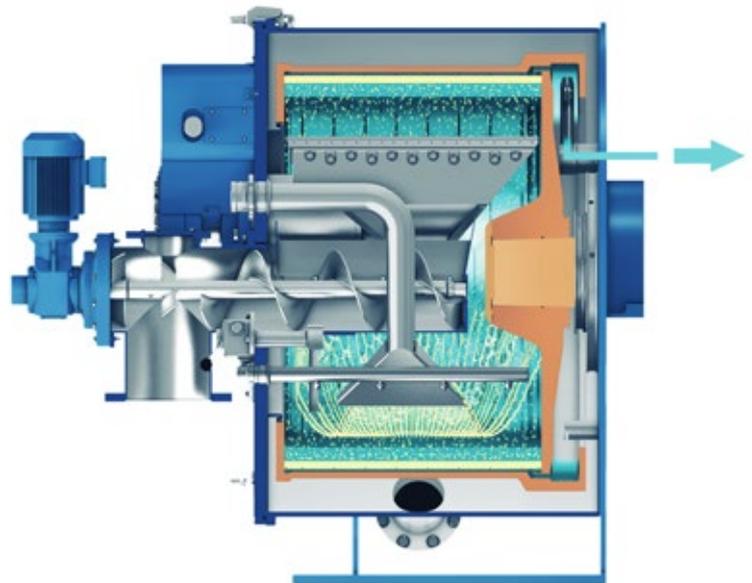
The filtration basket has a fabricated/welded or cast design and a filtration basket with a cylindrical shell and filtrate bores through which the filtrate is spun out into the filtrate housing after passing through the filter medium.



Filtration basket

ROTARY SIPHON BASKET

Contrary to the conventional perforated basket, the rotary siphon basket has a solid cylindrical shell with filtrate bores arranged radially at the rear end of the basket, where they are connected to a siphon-shaped chamber. Once it has penetrated the filter cake and the filter medium, the filtrate is redirected through axial channels beneath filter medium support segments into the siphon chamber, where a pivoting skimmer pipe extracts it from the centrifuge under positive pressure. The radial distance between the filter medium and the liquid level in the siphon chamber increases the driving force and thus, also the filtration rate.



Rotary siphon basket

Operation

FEEDING

The suspension is introduced into the rotating centrifuge basket via the feed distributor. Typically, this would include several intermittent feed pulses to prevent the suspension from spilling over the basket rim. The fill level is monitored and regulated by a feed controller. Normally, the basket is filled with solids up to 75–80% of the basket rim height. The feed step is complete when the filter cake has reached the desired level.

FILTRATION

Primary filtration of the mother liquor through the filter medium installed in the basket begins with the feed step and ends when the mother liquor submerges into the filter cake. The solids retained on the filter medium after completion of a cycle and discharge of the product serve as a filter medium for subsequent cycles.

WASHING

A cake washing step will often follow the primary filtration step. Wash liquid is introduced through the feed distributor or, for lower wash rates, through a separate spray bar. The wash liquid level is again monitored by the feed controller, and the wash step is concluded once the predetermined amount of wash liquid has been used and the liquid submerges into the filter cake.

DRY SPINNING

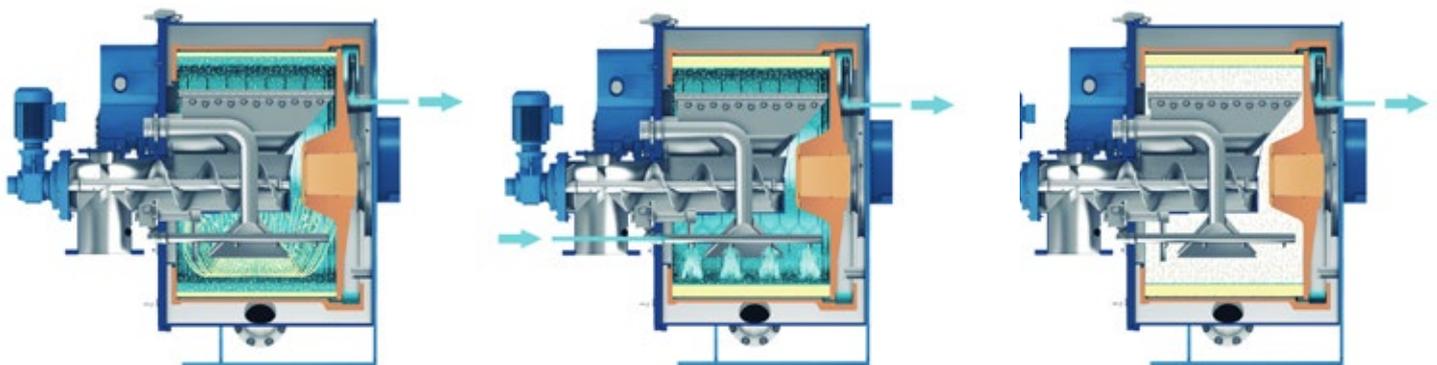
Immediately after the feed and wash step, which may be carried out at a lower speed, the basket is accelerated to maximum allowable speed for the cake dry spinning step, which ends when the desired residual cake moisture is reached or after a predetermined spin time.

PEELING/PRODUCT DISCHARGE

At the end of each centrifuge cycle, the filter cake is removed from the basket by a pivoting peeling device equipped with a broad peeler knife. Depending on the product characteristics, the peeling motion is conducted at full or reduced basket speed with adjustable swivel advance velocity. The layers of product scraped off are diverted into a trough and discharged from the centrifuge through an inclined chute or a horizontal screw conveyor. To protect the filter medium, a thin layer of filter cake is retained in the basket. This layer, called the residual heel, becomes the filter aid for subsequent cycles.

SCREW CONVEYOR

The peeled product is diverted to a horizontal, door-mounted screw conveyor that conveys the solids to the outside of the centrifuge.



Siphon basket feeding

Siphon basket washing

Siphon basket dry spinning

BACKWASHING

With the rotary siphon basket, it is possible to feed backwash liquid from an overhead-mounted prime tank through the siphon chamber to permeate the residual heel from underneath. This process re-suspends the residual heel and restores its permeability. It also primes the rotary siphon for the next filtration cycle. The liquid pool on top of the heel created by backwashing will help to distribute the subsequent cycle's incoming suspension evenly, which will virtually eliminate the potential for imbalances during the feed step.

RESIDUAL HEEL REMOVAL

After frequent cycles, the residual heel may have compacted with enough fine solids to make it impermeable, resulting in poor filtration performance. When this occurs, the heel can be regenerated (by backwashing in siphon peeler centrifuges) or removed pneumatically or hydraulically (in peeler centrifuges with filtration baskets).

PNEUMATIC HEEL REMOVAL

By blowing either compressed air or nitrogen against the heel through special flat-jet nozzles mounted on a pivoting and oscillating manifold inside the basket, the heel cake is broken up into pieces and discharged by the peeling device.

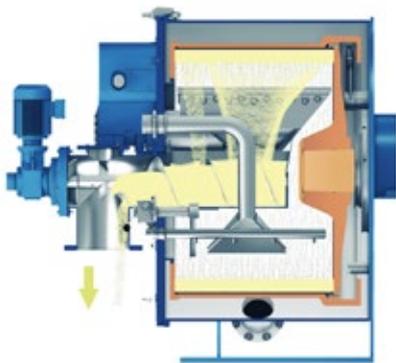
HYDRAULIC HEEL REMOVAL

Using the feed distributor, a large quantity of rinse liquid is introduced into the basket for a short period of time. The resulting shear forces create sufficient turbulence to lift the heel off the filter medium. The rinse liquid with the dispersed heel solids is discharged from the basket by the peeling device. This step requires diverting the liquid to outside the centrifuge away from the normal dry product discharge. The rinse liquid can be recycled to the main process or divided into heel solids and liquid in a separate process step.

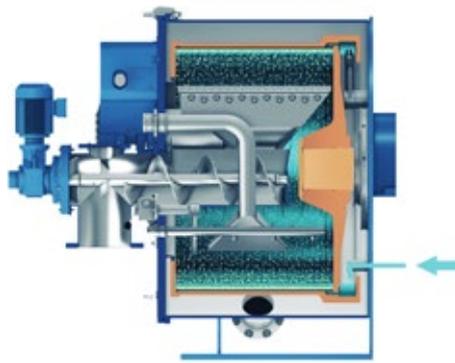
In both procedures, the heel is removed at low basket speeds to avoid tearing the filter medium. Hydraulic heel removal has the added advantage of simultaneously cleaning the interior of the centrifuge. The most suitable removal procedure will depend upon the specific application.

ADVANTAGES

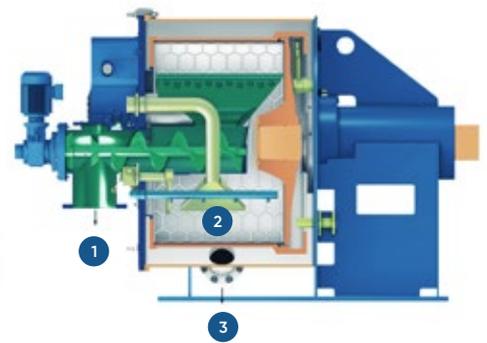
Higher centrifuge throughput due to the potential of utilizing longer baskets. Suitable for applications with solids showing a tendency to adhere and with increased internal friction factors, both of which affect the gravity flow inherent to chute discharge configurations.



Product discharge with screw conveyor



Siphon basket backwashing



1 Solids 2 Suspension 3 Filtrate

Centrifuge controls

Automatic and optimum operation of the centrifuge to yield a product with uniform quality at maximum capacity requires a sophisticated system for continuously monitoring and controlling a number of process and operating parameters, such as:

- Basket speed
- Feed time and basket filling level
- Filtration rate and spin time
- Wash ratio and wash time
- Safety-related inputs, interlocks, position indicators, and other process-related instrument signals

Typically, Krauss-Maffei peeler centrifuges are provided with variable frequency drives for operating the centrifuge within a speed range best suited for each application and/or step in the process cycle. Programmable control electronics housed in local operator panels and/or in remote control cabinets evaluate the process signals and adapt process parameters on a result-dependent basis. The core controlling devices in peeler centrifuges are feed controllers that provide the feedback signals for controlling the supply of product suspension, wash liquid, etc., to the centrifuge.



Standard paddle feed control, FC

Feed controllers are available in various configurations:

STANDARD PADDLE FEED CONTROL, FC

With spring-loaded/hydraulic pivoting motion or fully pneumatic operation.

THERMAL FEED CONTROL, TFC

The sensor arm of the TFC with an embedded thermocouple element is pivoted in and out at adjustable, regular intervals to touch the surface of the basket filling. The frictional heat between the sensor and the product generates a temperature signal, which is conditioned and evaluated by an electronic control module.

The advantages of the TFC are:

- The sensor can distinguish whether it touches a plane of liquid or the surface of a solid due to the different frictional heat created by the contact. It can also determine both the level of basket filling and the filtrate immersion point that signals the end of the filtration or wash step.
- Adjustable immersion frequency and contact time of the TFC sensor provide much more precise feedback on the prevalent processing conditions and allow faster, more efficient centrifuge cycles.



Thermal feed control, TFC

RADAR FEED CONTROL, RFC

The radar feed controller is a contact-free measurement system to detect the filling level in the basket. A radar probe emits a signal in the direction of the product in the basket. The signal reflected by the rising product is picked up by a sensor and analyzed by control electronics. The radar system by ANDRITZ offers the following benefits:

- Continuous level detection
- No mechanical contact with the product, eliminating splashing or dusting
- No mechanical wear on sensors, eliminating potential product contamination from eroded metal particles
- No dynamic seals
- Unobtrusive installation into the process area

FEED CONTROL ANALOG, FCA

The feed control analog (FCA) is a measuring system that senses the feed level continuously in the centrifuge basket and gives the operator detailed feedback on the feeding and washing process. This enables result-orientated operation of the centrifuge, with optimized throughput, washing, and product quality.

Further advantages are:

- Prevents overfilling of the basket to minimize product losses
- Limited contact with the product due to adjustable starting points
- Maximum basket feeding at every batch, even with varying feed concentrations
- Reduced splashing and abrasion because of small contact surface



Radar feed control, RFC

Dimensions and weights

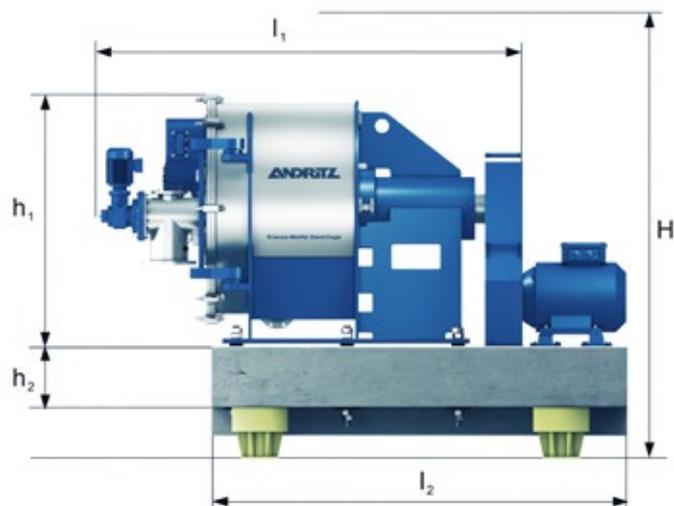
Model	Machine dimensions			Inertia block dimensions			Space requirements**			Weight 1	Weight 2
	L1*	B1 [mm]	H1	L2	B2 [mm]	H2	L	B [mm]	H	[kg]	[kg]
HZ 25/0.1	670	500	550	-	-	-	1,000	1,100	1,400	75	160
HZ 40/0.2	1,000	720	750	800	1,200	60	1,500	1,300	1,800	500	1,350
HZ 63/0.3	1,500	1,100	1,100	1,650	1,600	260	3,600	3,000	1,800	1,250	2,800
HZ 63/0.6	1,600	1,100	1,100	1,650	1,600	260	3,700	3,000	1,800	1,350	3,500
HZ 80/1.0	2,100	1,400	1,300	2,050	2,100	400	4,300	3,500	2,500	2,600	6,000
HZ 80/1.3	2,400	1,400	1,300	2,050	2,100	400	4,700	3,500	2,500	3,000	7,300
HZ 100/1.6	2,600	1,650	1,600	2,400	2,400	680	5,200	3,800	3,000	3,500	12,000
HZ 100/2.0	2,800	1,650	1,600	2,400	2,400	680	5,400	3,800	3,000	4,100	12,500
HZ 125/2.5	2,900	1,900	1,800	2,600	2,500	650	5,900	4,700	3,500	5,500	15,000
HZ 125/3.2	3,400	1,900	1,850	2,900	2,500	650	6,300	4,700	3,500	7,000	19,000
HZ 160/4.0	3,600	2,300	2,200	3,200	3,200	750	6,700	5,600	4,400	10,000	31,000
HZ 160/5.0	4,000	2,300	2,300	3,500	3,200	750	7,200	5,600	4,500	13,000	36,000
HZ 180/7.1	4,700	3,000	3,000	4,650	3,600	700	8,600	6,600	5,300	23,500	55,700
HZ 200/9.0	5,400	3,200	3,000	4,750	3,600	1,000	8,700	6,800	5,500	28,000	70,000

* May vary with discharge options

** Space requirements for operation and maintenance

Weight 1: without motor

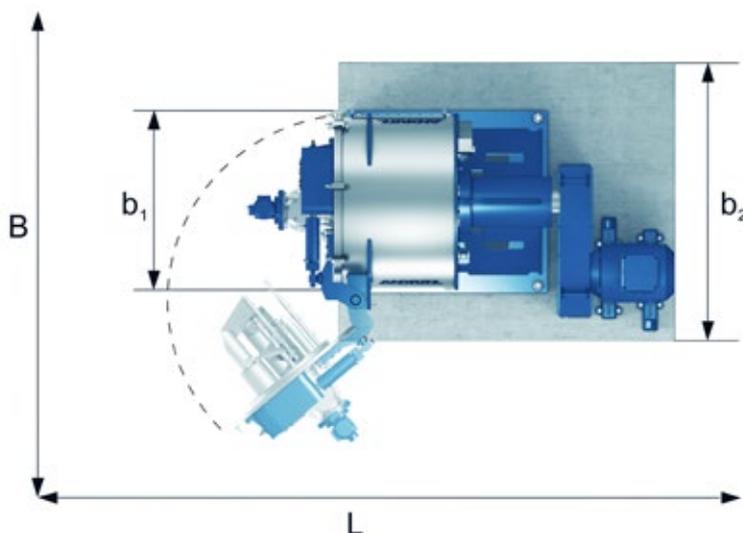
Weight 2: with inertia block and drive



All technical data are approximate and subject to change without notice.

Model	Basket inside diameter	Basket length	Basket volume	Filter area	G-force	Maximum* speed
	[mm]	[mm]	[l]	[m ²]	[-]	[rpm]
HZ 25/0.1	250	125	2.5	0.10	2,200	4,000
HZ 40/0.2	400	200	9.8	0.25	2,000	3,000
HZ 63/0.3	630	160	20.6	0.32	1,700	2,200
HZ 63/0.6	630	315	40.5	0.62	2,020	2,400
HZ 80/1.0	800	400	83.0	1.01	1,600	1,900
HZ 80/1.3	800	500	103.7	1.26	1,600	1,900
HZ 100/1.6	1,000	500	164.0	1.57	1,290	1,520
HZ 100/2.0	1,000	630	206.6	1.98	1,290	1,520
HZ 125/2.5	1,250	630	323.6	2.46	1,030	1,220
HZ 125/3.2	1,250	800	410.9	3.14	1,030	1,220
HZ 160/4.0	1,600	800	683.6	4.02	805	950
HZ 160/5.0	1,600	1,000	854.6	5.03	805	950
HZ 180/7.1	1,800	1,250	1,350.0	7.07	710	840
HZ 200/9.0	2,000	1,400	1,900.0	9.0	700	790

* The speeds stated are standard speeds and can be adjusted to your process requirements



All technical data are approximate and subject to change without notice.



Put our 150 years of OEM experience to work for you

Need to optimize your process? Boost availability? Ensure non-stop productivity? When you work with ANDRITZ, you gain access to one of the world's largest OEM manufacturers for solid/liquid separation. Put our in-depth knowledge of separation equipment and processing to work for you.

VAST EXPERIENCE THROUGH LARGE INSTALLED BASE

With an installed global base of more than 55,000 solid/liquid separation machines and systems, you can imagine that we take service seriously. Wherever these customers are located, we work very closely with them to maximize uptime and boost efficiency.

WELL-KNOWN OEM BRANDS

Some customers know us as the people with ANDRITZ on our overalls. Others have come to understand that we are the OEM behind former brand names like 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 Vandebroek – all companies that have been acquired by ANDRITZ. But frankly, we are capable of servicing and supplying spare parts for nearly all brands of solid/liquid separation equipment on the market.

LOCAL SUPPORT BACKED BY GLOBAL EXPERTISE

Our service philosophy is simple: One phone call, one contact person, one dedicated team that speaks your language and knows your equipment and process. This is not an empty promise. It is backed by a network of 550 service specialists for separation equipment and systems as well as service centers all around the world.

A TRUE FULL-SERVICE PROVIDER

Whether you need spare parts, rentals, local service, repairs, upgrades, or modernization of your equipment, ANDRITZ is your service specialist in all aspects of separation. 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. In short, we've got you covered.



LOCAL SUPPORT

Responsive local service centers and field service technicians



REPAIRS & UPGRADES

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



LAB AND ON-SITE TESTS

Lab and testing capabilities for process optimization and machine upgrades



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



SECOND-HAND & RENTALS

Certified second-hand and rental machines





Intelligence for machine and process control

With Metris addIQ, you have 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.

METRIS addIQ CONTROL SYSTEMS

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 have 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. addIQ control systems are part of Metris, the ANDRITZ brand for digital solutions.



Metris
ANDRITZ Digital Solutions



ANDRITZ offers a broad and constantly growing range of innovative products and services in the industrial digitalization sector under the brand name Metris, helping customers to enhance plant efficiency and profitability, optimize the use of resources, achieve constant and highest product quality, reduce production downtime, and maximize user-friendliness.



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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