



SEPARATION

**SOLIDIFICATION BY
COOLING - AT ITS BEST**

ANDRITZ GOUDA DRUM FLAKER

ANDRITZ

ENGINEERED SUCCESS

Do you need a completely closed cooling system for chemicals, pharmaceuticals, or food processing? Thanks to the closed design of the ANDRITZ Gouda drum flaker, there is no risk of cross-contamination between the cooling medium and the solidifying product. Also, the special casing prevents toxic vapors and dust emissions from escaping during flaking. Efficient and safe.

ANDRITZ is the world's leading separation specialist, with the deepest knowledge, broadest technical resources, and most comprehensive service. Yes, we do build machines, but our expertise goes way beyond our production skills. We create, develop, implement, and maintain innovative solutions. Complete processing lines, including peripherals if you like, answering all your separation challenges. This is a clear mission that we live up to in our daily operations. Whatever requirement you have, our product range is wide and extensive enough to respond to your specific needs. Whether you operate in the food, environmental, chemical, or mining & minerals industry, we are ready to become your trusted partner.

Reliable solution for processing liquid products to obtain solid flakes with excellent quality

With the ANDRITZ Gouda drum flaker, liquid material is converted into a solid product by cooling.

A thin layer of the liquid material is applied to the outside of a rotating, internally cooled drum in a continuous process. The moment it comes into contact with the cold drum surface, heat is removed from the product, which instantly begins to solidify and cool down to the required final temperature. After almost one full rotation, a knife removes the solidified layer from the drum. The product then breaks into easy-to-handle flakes.

The operator can adjust the flake size by controlling the circumferential speed, layer thickness, and knife angle. The careful design of the ANDRITZ Gouda drum flaker ensures optimum use of the drum surface area to maximize capacity at the chosen operating conditions.

YOUR BENEFITS

- Completely enclosed and thus safe cooling system
- Suitable for chemicals, pharmaceuticals, and food processing
- Flexible for different sludges
- Easy inertization of the process
- Compact unit, little floor space required
- Low operating and maintenance costs



ANDRITZ Gouda drum flaker, model KBO20/40

Solidification by cooling in a fully enclosed system

The closed design of the ANDRITZ Gouda drum flaker is ideally suited to any kind of demanding solidification task.

We are all striving more and more to reduce the environmental footprint of our actions and the impact they have on human health. In view of the ever increasing requirements in this domain, ANDRITZ has developed a well-considered, fully enclosed solidification concept that offers you a number of innovative features:

- There is no cross-contamination between the cooling medium and the product.
- No toxic or unpleasant odorous vapors, hazardous fumes, nor dust are released into the atmosphere during flaking thanks to the special casing.
- The cooling drum can be supplied with a gas-tight casing. Construction materials range from carbon steel to various grades of stainless steel, including Hastelloy. Your choice will depend on the chemical properties and adhesion ability of the product to be processed.
- Oxygen-sensitive products may be protected by inert gas blanketing.
- In cases where products tend to cause heavy sublimation deposits in the casing, a heated wall design can be used to keep the necessary cleaning work to a minimum.



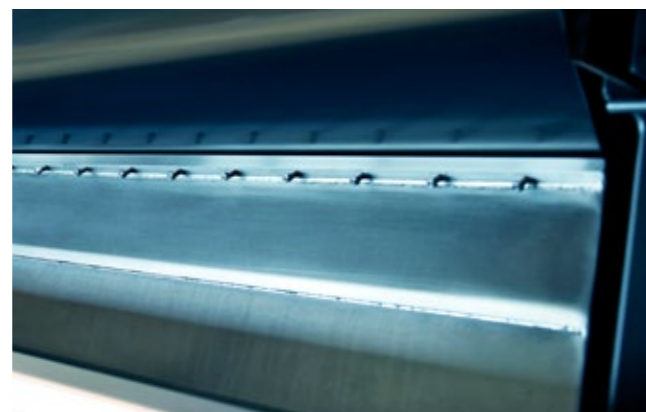
Grooved drum design

SPECIAL DRUM DESIGN

Our cooling drums are specifically designed for maximum geometric stability. Also, the drum design ensures even temperature distribution over its entire length, resulting in uniform flakes with low fines content. For products with poor adhesion to metal surfaces, we advise you to consider an ANDRITZ Gouda drum flaker with specially grooved surfaces.

COOLANT CIRCULATION

The liquid coolant or refrigerant is sprayed directly onto the internal drum surface by a central spray pipe, and it is discharged by siphoning. The design enables feed and discharge of the coolant through one and the same shaft. The entire coolant distribution system is made of stainless steel and is easily accessible for inspection and maintenance purposes.



Scraper knife

ROBUST SCRAPER KNIFE

The ANDRITZ scraper assemblies have a robust design to ensure uniform pressure on the drum over its entire length and to eliminate vibrations. The knife pressure can be easily adjusted by means of a pneumatic pressing system that is mounted outside the casing. Scraper knives are available in a range of materials, from bronze to technical plastics.

Flexible operation thanks to multiple design configurations

The ANDRITZ Gouda drum flaker design has been enhanced in cooperation with renowned global companies to best meet the demanding requirements of food and chemical production plants.

The ANDRITZ Gouda drum flaker can be designed accordingly to meet your application needs and plant requirements. Besides special materials of construction and enclosed designs, specific features are also available that help to process all kinds of product consistencies.

FIELD OF OPERATION

Operating principle — Contact cooling (solidification)

Operating mode — Continuous

Consistency of wet product — Pumpable hot melt

Heat transfer medium — Water
Water/glycol mixtures
Other cooling brines

Particle size — N.A. for wet product

Product conveying — Product sticking to drum surface

Cooling medium temperature — -20 °C to +80 °C

Cooling time — Between 2 seconds and 5 minutes

Materials of construction — Stainless steel
Steel, chromium-plated

Various designs for different operating principles

Whatever requirement you have, the ANDRITZ product range is wide enough to respond to your specific needs, no matter whether you operate in the chemical, pharmaceutical or food industry. Depending on the product to be solidified, you have the choice between an ANDRITZ Gouda drum flaker with dip feed, bottom dip roll, or overhead applicator rolls. Additionally, ANDRITZ has a range of specialty machines for products with poor solidifying or adhesion properties, such as machines with a specially grooved drum surface.



DIP FEED (K FLAKER)

- For products with low viscosity and good adhesion properties, e.g. phthalic anhydride, caprolactam, bisphenol, naphthalene and DMT.
- The rotating drum dips directly and continuously into the melted product contained in a heated pan under the drum.
- A film of product solidifies immediately on the cooled drum surface. In addition, a thin layer of liquid adheres to the solid layer, passes out of the pan and solidifies during completion of the drum rotation.



BOTTOM DIP ROLL (KOO FLAKER)

- For products with good adhesion to metal surfaces and low to moderate viscosities, e.g. various waxes, resins, and catalysts.
- A heated applicator roll is located under the drum and dips into the melted product.
- The film of product that sticks to the applicator roll is transferred to the cooling drum and solidifies.
- Flake thickness can be controlled (between certain limits).



OVERHEAD APPLICATOR ROLLS (KBO FLAKER)

- For products showing poor adhesion to metals and moderate to high viscosities, e.g. soaps, stearates, and fatty acids.
- An internally heated applicator roll is located above the cooling drum. The liquid product is fed into the nip between the applicator roll and the drum.
- A film of product passes through the gap between the roll and the drum, sticks to the cold drum, and solidifies.
- Contact with the heated roll ensures that the product remains liquid in the feeding system.
- Heated end plates prevent leakage at the sides, both during applicator roll gap setting and thermal expansion.
- Flake thickness can be controlled through the gap setting mechanism of the applicator roll.

Applications for the food industry

Finding the right machine, with the reliability and the features you need, has an important impact on your profitability.

With more than 100 years of experience in the food industry, ANDRITZ is one of the world's largest suppliers of equipment for food applications. One of our state-of-the-art machines for your demanding operating conditions is the ANDRITZ Gouda drum flaker. As a food manufacturer, your production requirements include high product quality, rapid cooling, and an extended shelf life. At the same time, you need to ensure energy efficiency. With the ANDRITZ Gouda drum flaker, you can easily meet all these stringent demands. But we don't just deliver the machine. Our experts can help you define your production process and even provide food laboratory services if you wish.

APPLICATIONS

- Cheese
- Chocolate
- Dough
- Vegetables



Chocolate flakes

Applications for the pharmaceutical industry

There are several concepts to choose from, including tailored solutions for industrial applications.

At ANDRITZ, we appreciate that no two pharmaceutical solidification solutions are the same. Since your application requirements depend very much on your unique process and the pollutants potentially to be filtered out, the last thing you need is a standard solution. The ANDRITZ Gouda drum flaker with overhead applicator rolls is tailored to the specific needs of the pharmaceutical industry. Whether you are commodity-driven or specialty-oriented, we help you maximize your operating efficiencies and strive for outstanding performance and excellent product quality.

APPLICATIONS

- Stearates
- Soaps
- Fatty alcohols



Soap flakes

Applications for the chemical industry

Fine chemicals are complex, pure substances, often produced in limited quantities in multi-purpose plants.

The main demands set by the chemical industry to equipment suppliers are a high safety standard, maximum plant operating time, the economic use of energy, and competence in problem solving. Over the years, ANDRITZ has obtained extensive knowledge on treating different chemical applications. Our ANDRITZ Gouda drum flaker, especially the design with dip feed, is perfectly suited to olidification and flaking of your various fine chemicals.

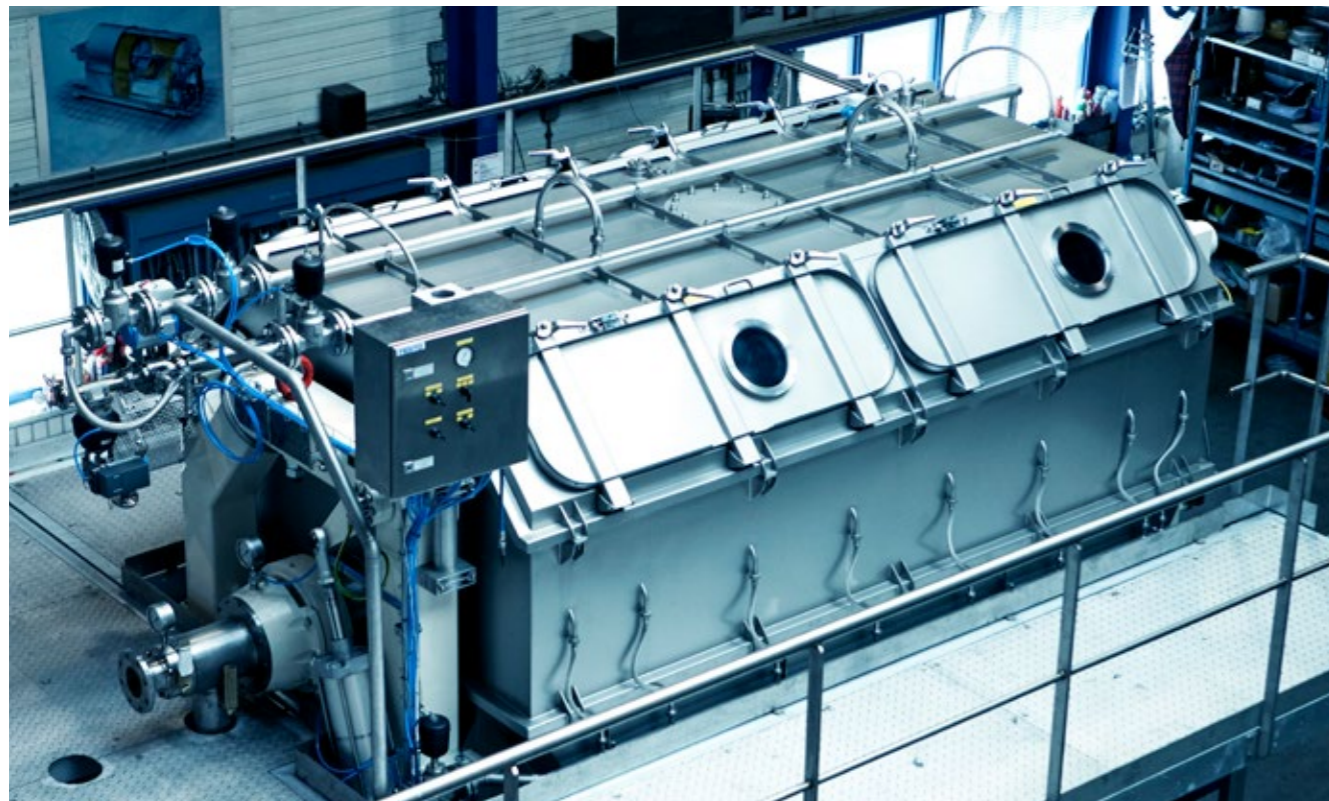
For industrial use, you often need to investigate product properties under real process conditions, as well as the feasibility of a desired process. For this purpose, we invite you to our pilot plant – a test center for reliable upscaling to industrial size. Feasibility tests can usually be conducted at short notice. Do not hesitate to contact us if your application is not in the list below.

APPLICATIONS

- Oleochemicals
- Phthalic anhydride
- Polyethylene glycols (PEG)
- Maleic anhydride
- Calcium chloride
- Caprolactam
- Resins
- Bisphenol A
- Sulfur



PEG Polyethylen glycols

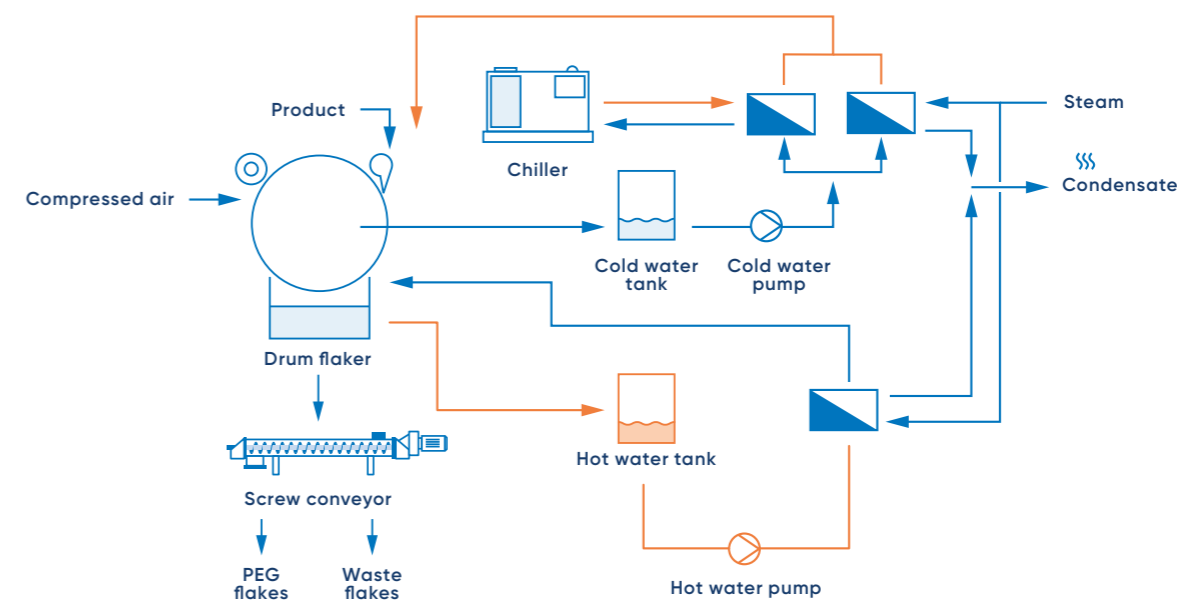


Fully enclosed ANDRITZ Gouda drum flaker unit for the chemical industry.

Process solutions on demand

Tailored separation systems in response to your application manufacturing process

ANDRITZ creates, implements, and maintains innovative process solutions – tailored systems to improve your production unit. We have the answer to all your specific separation challenges, delivering state-of-the-art machines and all peripherals for your processing line.



Cooling skid in PEG process line

Reliable upscaling and viability confirmation

With the ANDRITZ pilot plant – a valuable test center – we can reliably scale up to industrial sizes and confirm the viability of new processes.

ANDRITZ offers different test possibilities. We can perform feasibility tests with a small amount of product to determine its potential. This requires approximately 1 kg of product on a bench-scale machine to determine the product behavior and produce a small sample.

If you want us to determine or prove the viability and potential success of new process technology, the only reliable option is a pilot plant test with approximately 100 kg of product. We have several pilot plants available, including fully equipped mobile rental units for on-site test work at your location.

In our pilot plants, we test new materials, generate design data, determine process parameters, and provide representative product samples. This is a unique feature and part of the ANDRITZ R&D program.

But above all, the pilot plant is your opportunity to simulate your production process with a view to testing or optimization before implementation. We work with calculation models that have proven successful every time for scaling up to industrial size. Since the pilot plant also investigates the feasibility of a desired process, you avoid unpleasant surprises in the real-life production process. It goes without saying that this approach contributes significant cost savings in the years of operation to come.

We strongly recommend making use of this facility. In a pilot plant, all attention is focused exclusively on your product, your processing line or application. Together, we focus on your requirements and your separation challenge. The aim is to find the best solution for your production process.



ANDRITZ Gouda drum flaker in the pilot plant

Meeting your highest standards thanks to research and development

R&D is the cornerstone of ANDRITZ's success. The R&D activities are carried out in close co-operation with you as a customer. Our research centers focus on the feasibility, improvement, and further development of the desired processes or products.

To meet your expectations, we are implementing future standards today. Creating better, cleaner, comprehensive machines with best-grade stainless steel parts. We design systems with minimal energy exhaust and dust emission and without complicated filter installations. And, of course, we ensure optimal hygiene throughout the processing line, allowing you to operate according to HACCP/EHEDGE standards.

Several hundred employees work in ANDRITZ R&D centers worldwide, continuously developing innovative and customized technologies. The main focus lies on high-level environmental protection, sustainable production, and on extending the machine life cycle. We involve our R&D staff directly in project development, preparation of quotations, and project execution. Consequently, you have direct access to our R&D know-how. Our long-term ambition is to help you to comply with environmental specifications in the best possible way and to generate economic added value by reducing costs and increasing productivity.

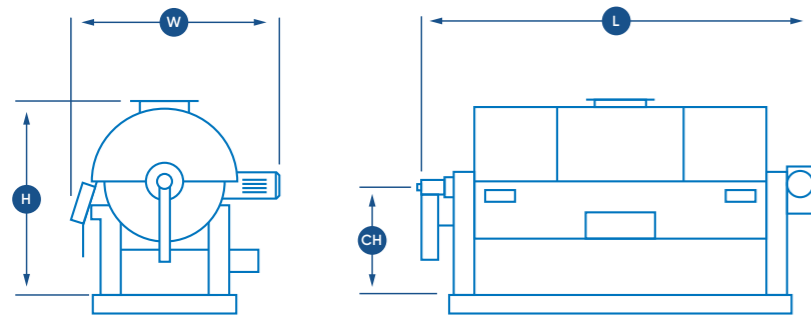


R&D feasibility testing in the pilot plant

Dimensions and models

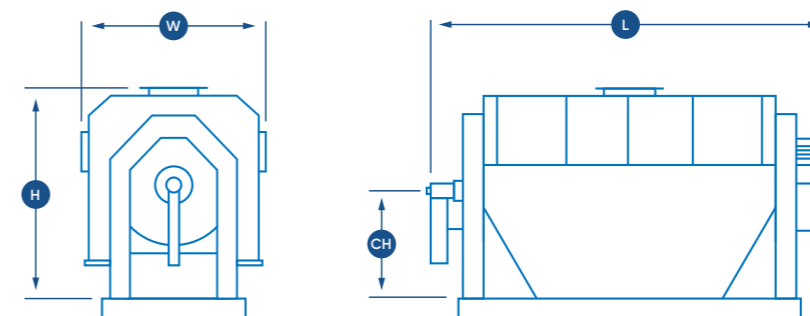
The ANDRITZ Gouda drum flaker comes in a variety of sizes, varying from a cooling surface area of 0.75 m² to 28 m².

ANDRITZ GOUDA DRUM FLAKER MODEL K (FLAKER WITH DIP FEED)



		5/5	5/10	10/10	10/15	10/20	15/20	15/30	15/40	20/40	20/45
Cooling surface area	m ²	0.75	1.5	3.1	4.7	6.3	9.3	14	19	25	28
Drum diameter	mm	500	500	1,000	1,000	1,000	1,500	1,500	1,500	2,000	2,000
Drum length	mm	500	1,000	1,000	1,500	2,000	2,000	3,000	4,000	4,000	4,500
Length** (L)	m	1.5	2	2.5	3	3.5	4.0	5.0	6.0	6.0	6.5
Width** (W)	m	1.3	1.3	1.8	1.8	1.8	2.5	2.5	2.5	2.8	2.8
Height** (H)	m	0.95	0.95	1.8	1.8	1.8	2.4	2.4	2.4	3	3
Center height (CH)	m	0.55	0.55	1.1	1.1	1.1	1.4	1.4	1.4	1.7	1.7
Foundation weight	t	0.8	1.2	2.7	3.6	4	10	10.6	11.2	13.0	13.6
Net shipping weight	t	0.8	1.1	2.5	3.3	3.7	7.3	8.8	10.3	12.6	13.1
Gross shipping weight	t	0.9	1.3	2.8	3.7	4.1	8.0	9.5	10.8	13.2	13.8
Shipping volume	m ³	2.5	3.5	11.5	13.5	16	24	30	36	51	55
Motor power	kW	0.55	1.1	1.5	1.5	2.2	5.5	7.5	7.5	15	15
Maximum	kW	0.75	1.75	2.2	3	4	7.5	11	11	30	30

DRUM FLAKER MODEL KBO (FLAKER WITH OVERHEAD APPLICATOR ROLLS)



		5/5	5/10	10/10	10/15	10/20	15/20	15/30	15/40	20/40	20/45
Cooling surface area	m ²	0.75	1.5	3.1	4.7	6.3	9.3	14	19	25	28
Drum diameter	mm	500	500	1,000	1,000	1,000	1,500	1,500	1,500	2,000	2,000
Drum length	mm	500	1,000	1,000	1,500	2,000	2,000	3,000	4,000	4,000	4,500
Length** (L)	m	2.0	2.6	2.6	3.1	3.6	4.2	5.2	6.2	6.0	6.5
Width** (W)	m	1.5	1.5	1.8	1.8	1.8	2.6	2.6	2.6	2.8	2.8
Height** (H)	m	1.4	1.4	2.0	2.0	2.0	2.6	2.6	2.6	3	3
Center height (CH)	m	0.8	0.8	1.1	1.1	1.1	1.4	1.4	1.4	1.7	1.7
Foundation weight	t	1.0	1.5	3.1	4.1	4.8	10.7	12.1	13.6	13.0	13.6
Net shipping weight	t	1.0	1.3	3.2	4.0	4.6	8.8	9.7	10.5	12.6	13.1
Gross shipping weight	t	1.1	1.5	3.6	4.4	5.1	9.3	11.4	11.0	13.2	13.8
Shipping volume	m ³	5.5	6.5	12	14.5	17	36	43	50	51	55
Motor power	kW	0.75	1.1	1.5	2.2	3	5.5	7.5	7.5	22	22
Applicator roll	kW	pinion	pinion	0.25	0.37	0.55	0.75	1.5	1.5	3	3

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.

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.



Your full-service provider

With ANDRITZ, 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 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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