



SEPARATION
**SOLIDIFICATION
AT ITS BEST**

ANDRITZ GOUDA DRUM FLAKER

ANDRITZ

ENGINEERED SUCCESS



The process: flakes with free-flowing characteristics

Increased efficiency through a unique operating principle.

The drum flaker is used primarily to process chemical and pharmaceutical products. However, more and more applications for these machines are also being found in the food industry. The closed design is ideally suited for processing of toxic or offensively smelling products.

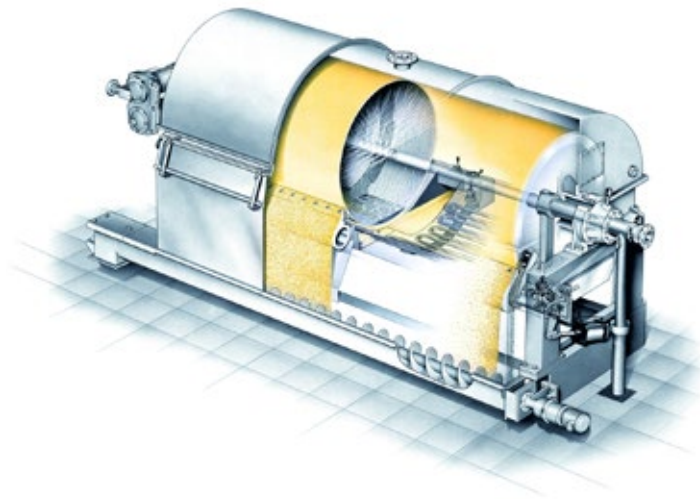
With the drum flaker, a molten product is converted into a solid form. A thin layer of the liquid product adheres to the outside of the rotating, internally cooled drum in a continuous process. Heat is extracted from the product by contact with the cooled drum surface, and the product solidifies and cools to the required final temperature.

A stationary knife removes and breaks up the solidified layer.

The required flake size is achieved by controlling circumferential speed, layer thickness, and knife angle. Careful design ensures optimum use of the drum surface area to maximize capacity at the chosen operating conditions. The drum flaker is primarily used to produce flakes, but there are also ways of converting your product into easily manageable pastilles or prills.

Features and equipment adapted to customers' needs

Several concepts to choose from, depending on the upstream processes and potential pollutants to be filtered out, including tailored solutions for industrial applications.

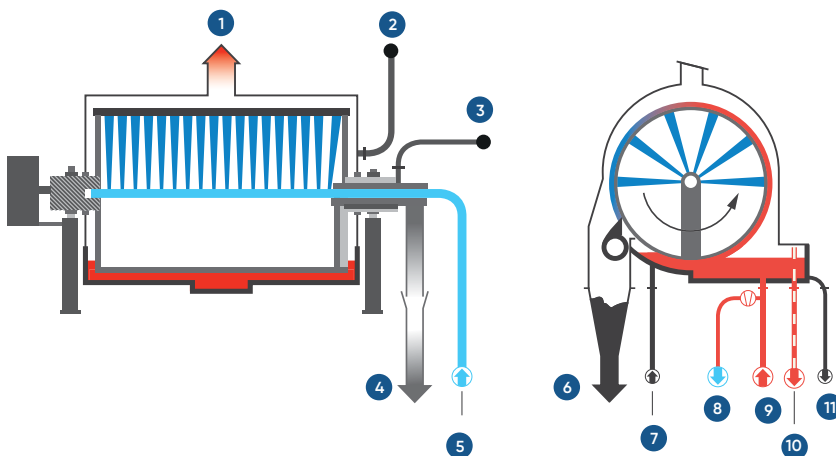


MAIN BENEFITS

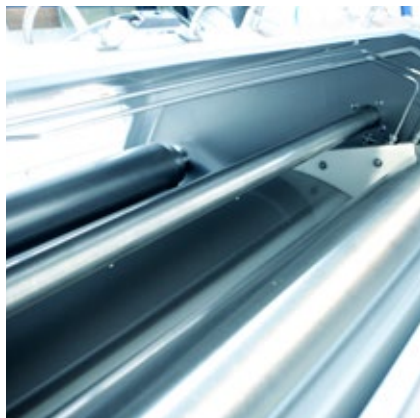
- Completely closed cooling system
- Construction material ranges from carbon steel to various grades of stainless steel, and Hastelloy
- Compact unit, little floor space required
- Easy inertization of the process
- Gas-tight enclosures
- Unit designed with good access for maintenance and cleaning
- No cross-contamination between cooling medium and product
- Low operational and maintenance costs

SPECIAL CASING FOR TOXIC AND HAZARDOUS FUMES

In view of the current environmental and health requirements, most drum flakers are equipped with a fully enclosed casing to prevent toxic, offensive smelling, vapors and dust from appearing during flaking. Oxygen-sensitive products may be protected by inert gas blanketing. In cases where products tend to cause heavy sublimation deposits in the enclosure, a heated wall design can be used to minimize internal cleaning. Large hatches are provided with quick release closures for easy cleaning, inspection, and knife replacement. Hatches are flush with the inside of the machine hood.



- 1 Fume removal 2 Inert gas
- 3 Air (syphon assist) 4 Cooling water discharge
- 5 Cooling water 6 Flaker discharge
- 7 Heating medium feed 8 Melt drain
- 9 Melt feed 10 Adjustable overflow
- 11 Heating medium discharge



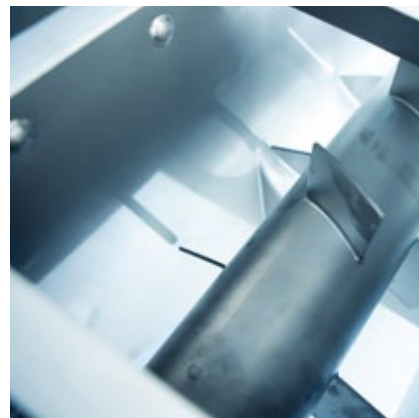
THE DRUM

Cooling drums are available in a choice of materials selected in accordance with the chemical properties and adhesion ability of the product to be processed. The materials range from fine grain cast iron and carbon steel to Hastelloy, etc. The drums are specially designed for maximum geometric stability. Distortion due to differential temperature gradient or mechanical forces is impossible in normal operation. The drum design ensures equal heat transfer over the entire drum surface, ensuring uniform flake size distribution. For products with poor adhesion to metal surfaces, drums with special grooved surfaces are available.



COOLANT CIRCULATION

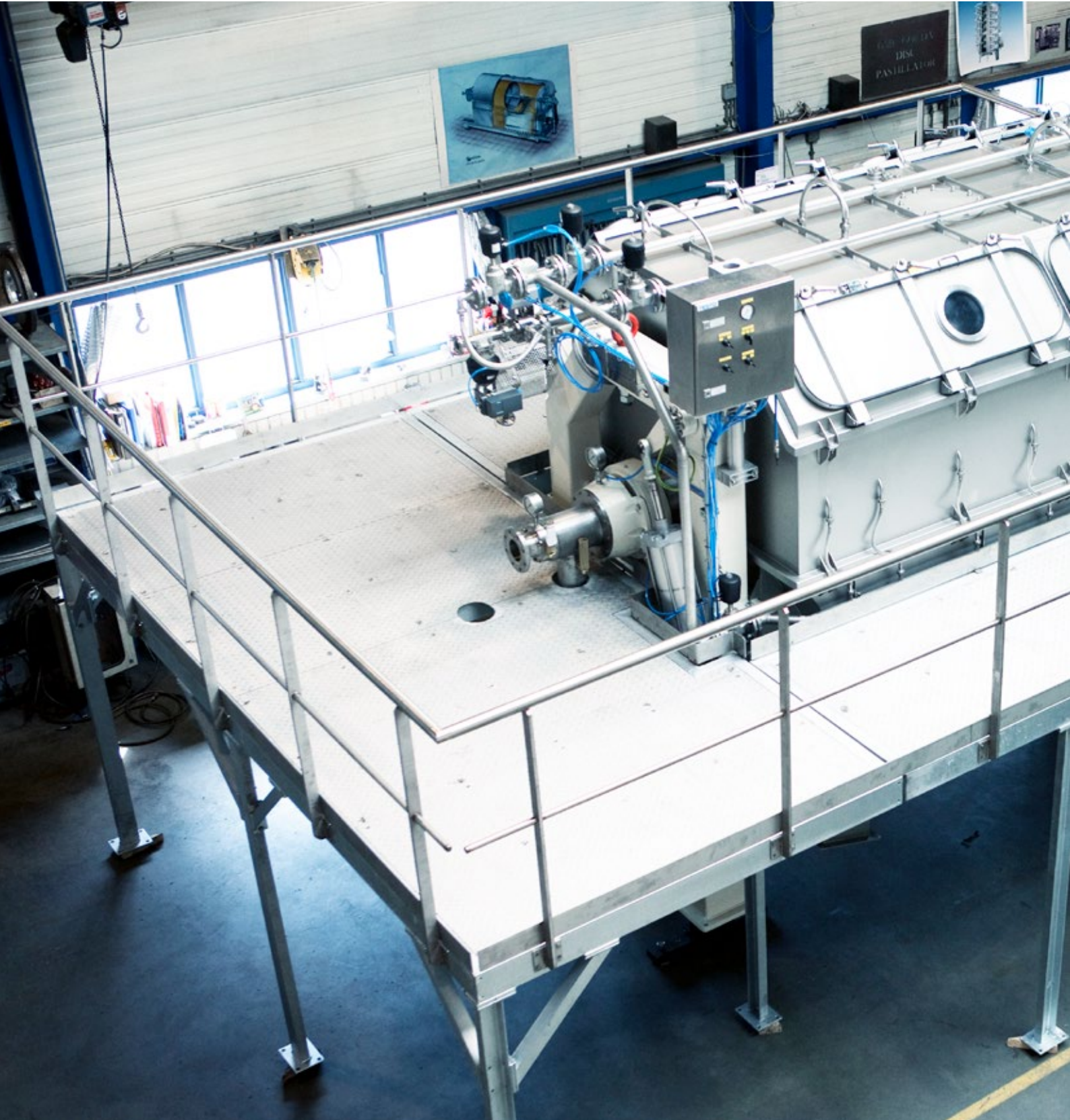
When liquid refrigerants are used, these are sprayed by a central spray tube over the internal drum surface. The turbulent flow ensures maximum heat transfer over the full drum surface, including over shell ends and heads. Consequently, an equal temperature is guaranteed over the total length of the drum, resulting in uniform flakes with low fines content. The liquid is siphoned off from the lowest part in the drum to avoid an accumulation of refrigerant there. The siphoning action is assisted by some slight overpressure inside the drum. The entire system, made of stainless steel, is easily detachable without disassembly of the drum. This design enables feed and discharge of the refrigerant through one and the same shaft, while the other shaft is used for the drive. Moreover it offers excellent accessibility to the inside of the drum for cleaning and inspection. Some options are available, such as refrigeration through direct evaporation of Freon or ammonia.



SCRAPER ASSEMBLY

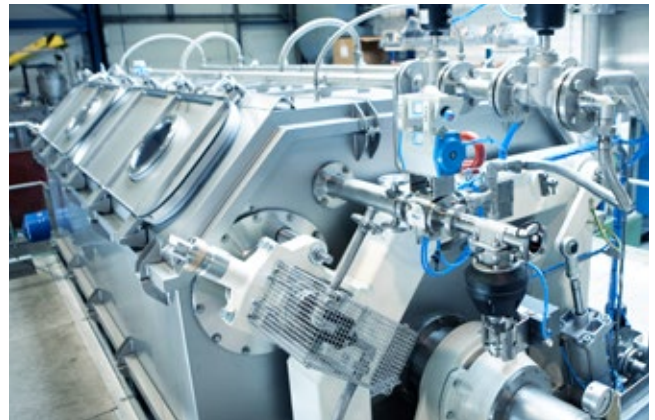
Rigid construction designed to ensure a uniform pressure against the drum over the full length and to eliminate vibrations. The knife pressure is effected and controlled by means of a pneumatic pressing system. For entirely enclosed machinery, the knife's pressing system is located outside the process environment. Scraper knives are available in a range of materials, from steel to technical plastics. The flake size can be determined in advance by the choice of scraper system.

Visual impressions of the **ANDRITZ Gouda drum flaker**





Platform for easy and safe operation



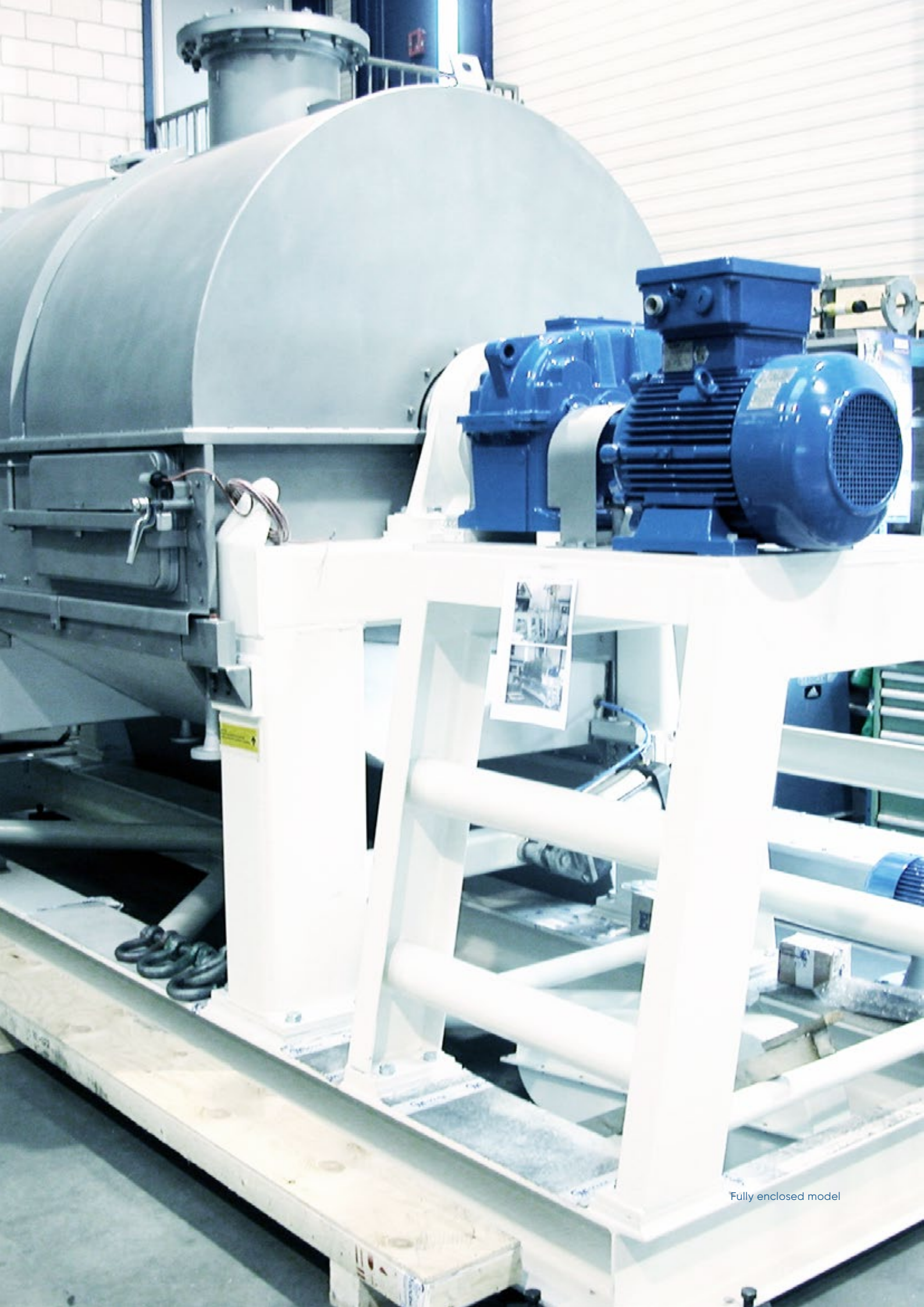
Enclosed design with coolant circulation



Pneumatic knife pressing system



Cooling drum



*Fully enclosed model

Various designs for different operating principles

ANDRITZ supplies a number of specialty machines for special situations.

In view of the large variety of products in the chemical and food industries, it will come as no surprise that ANDRITZ also supplies an extremely varied range of machines. This variation is not only in design and operating principle, but also in materials used.

PRODUCTS WITH POOR SOLIDIFYING PROPERTIES

There are products that do not match the operating principles described on this page, such as products with neither good nor poor adhesion properties, but with poor solidifying properties instead. For those situations, ANDRITZ has a range of specialty machines. The surface can also be furnished with special

(dovetail-sectioned) grooves for products with poor adhesion properties.

THE DRUMS MATERIAL

The drums are mostly made of stainless steel. Besides the choice of many types of stainless steel, chromium-plated, Hastelloy, or cast iron drums are also possible. The exact choice will depend on your product, the work site environment, available space, and the process to be performed. The result is a durable drum with high dimensional stability and uniform heat distribution over its entire surface.



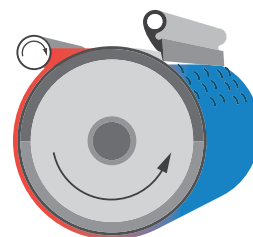
DIP FEED (K FLAKER)

For products with low viscosity and good adhesion properties. The rotating drum dips directly into the melt contained in a heated pan under the drum. A film of product solidifies immediately on the drum surface during its contact with the melt. In addition, a thin layer of liquid adheres to the solid layer, passes out of the pan and solidifies during completion of the drum revolution. Among the products processed on this type of drum flaker are phthalic anhydride, caprolactam, fatty acids, bisphenol, naphthalene and DMT.



BOTTOM DIP ROLL (KOO FLAKER)

A heated applicator roll is located under the drum and dips into the melt. The film of liquid melt that sticks to the applicator roll is transferred to the cooling drum and solidifies. For products with good adhesion to metal surfaces and low to moderate viscosities, flake thickness may be controlled between certain limits. Applications are flaking of various waxes, resins, and catalysts.



OVERHEAD APPLICATOR ROLLS (KBO FLAKER)

For accurate control of end product thickness and shape, an internally heated applicator roll is located above the cooling drum. The melt is fed into the nip between the applicator roll and the drum. Contact with the heated roll ensures that the product remains liquid in the feeding system. Heated endplates prevent leakage of the melt to the sides both during applicator roll gap setting and thermal expansion. A film of melt passes through the gap between the roll and the drum, sticks to the cold drum, and solidifies. For products showing poor adhesion to metals and moderate to high viscosities, flake thickness may be controlled accurately through the gap setting mechanism of the applicator roll. Applications can be found for example in processing of soaps, stearates, and fatty acids.



Calcium chloride

Fine chemicals applications

Fine chemicals are complex, single, pure chemical substances, produced in limited quantities in multipurpose plants in multistep batch chemical or biotechnological processes.



Resins

The main demands set by the chemical industry to suppliers of equipment are a high safety standard, maximum plant operating time, the economic use of energy, and competence in problem solving.

The ANDRITZ Gouda drum flaker can be used for solidification and flaking of various fine chemicals. For industrial implementation, some product properties must be investigated under real process conditions. This can be arranged in our pilot plant. Over the years, ANDRITZ has obtained knowledge on treatment of different chemical applications. Do not hesitate to contact us if your application is not in the list. Feasibility tests can usually be executed at short notice.

APPLICATIONS

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

Food industry applications

Your time is important, just like your equipment selection. Finding the right machine, with the reliability and the features you need, has an impact on your profitability.



With more than 100 years' experience in the food industry, ANDRITZ is one of the world's largest suppliers of equipment for food applications. One of the machines that is used is the drum flaker.

Today's food manufacturers require high product quality, rapid cooling, and extended shelf life, while ensuring they remain energy-efficient. Our experts can help you define your production process. This includes providing food laboratory services.

APPLICATIONS

- Cheese
- Chocolate
- Dough
- Vegetables



Dough

Pharmaceutical industry applications

Several concepts to choose from depending on the upstream processes and potential pollutants to be filtered out, including tailored solutions for industrial applications.



ANDRITZ's experienced sales and engineering specialists recognize a number of very important factors in supplying solidifying solutions - no two pharmaceutical applications are the same, all application requirements are unique, and the last thing you need is a "standard" solution. Our application solutions are successful because of our understanding of the specific demands and requirements of the pharmaceutical industry.

Our focus lies on maximizing your operating efficiencies, whether you are commodity-driven or specialty-oriented. We will work with you on your individual applications, or on upgrading existing process systems. With today's economy demanding that the quality of your product is excellent, we continue to help you fulfill your requirements for outstanding performance. Please contact us if you would like to learn more about our successful applications in the pharmaceutical industry.

APPLICATIONS

- Stearate
- Soaps



Soap test in our pilot plant



Drum flaker - bench type

Our pilot plant

A valuable test center to determine new process technology viability and success.



Flake test in our pilot plant

A unique feature and part of the ANDRITZ R&D program is the pilot plant. The pilot plant is a valuable test centre for simulating production processes with a view to testing or optimization of a process before implementation.

The pilot plant is also used to investigate the feasibility of a desired process. Combined with state-of-the-art manufacturing technologies, ANDRITZ offers an integrated approach for the set-up of processing lines, contributing to significant cost saving (for the customer) in the production process.

TESTING POSSIBILITIES

Feasibility test:

Requires a small amount of product to determine its 'flaking ability'.

Bench-scale test:

Requires approximately 1 kg of product on a bench-scale drum flaker to determine flake behavior and produce a small sample.

Pilot plant test:

Requires approximately 100 kg of product to determine a guaranteed capacity and process parameters on a pilot plant drum flaker.



Pilot plant tests



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



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.

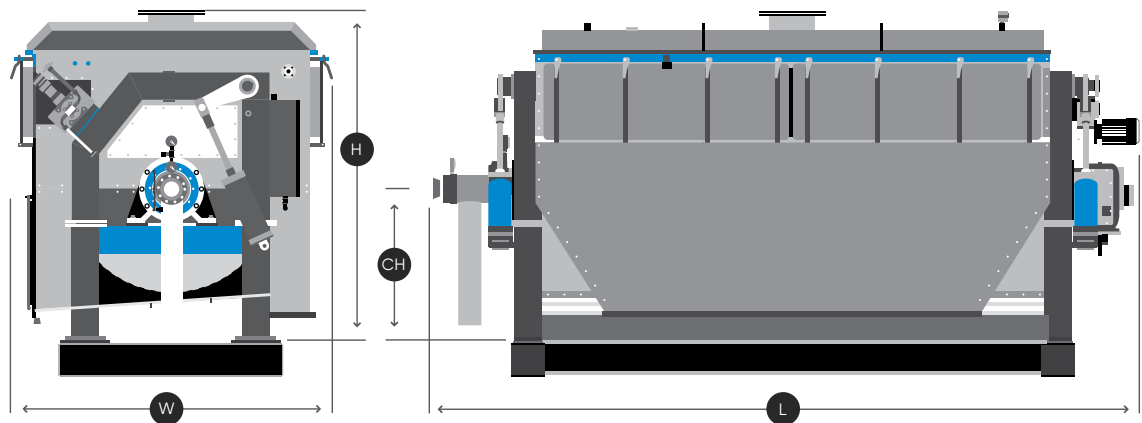
Our tailored turnkey systems from a single supplier can improve entire plants or individual machines. By providing state-of-the-art automation technologies and digitalization, we ensure best-in-class performance. Automating machine and plant equipment measurably reduces gaps in many different production 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.

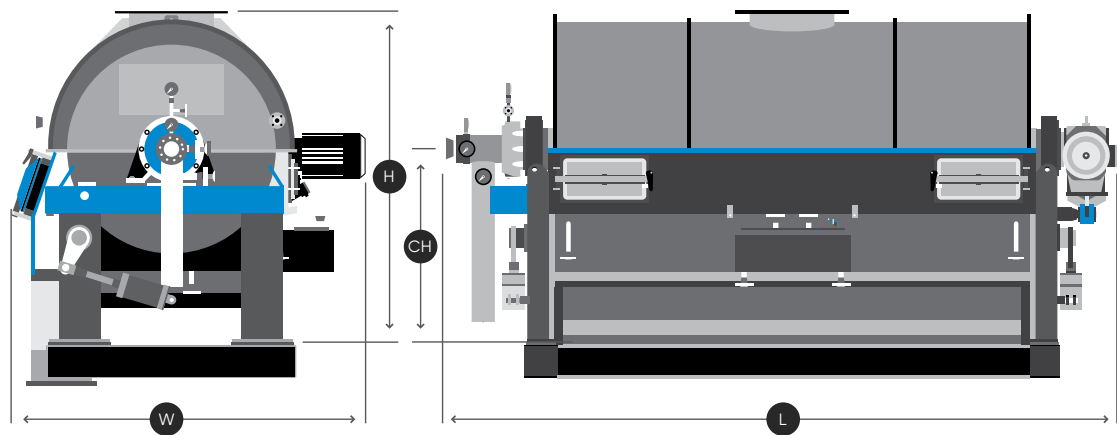


Dimensions and models

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



K flaker (flaker with dip feed)



KBO flaker (flaker with overhead applicator rolls)

DRUM FLAKER MODEL K

		5/5	5/10	10/10	10/15	10/20	15/20	15/30	15/40	20/40	20/45
Cooling surface	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	2.0	2.5	3.0	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	ton	0.8	1.2	2.7	3.6	4.0	10.0	10.6	11.2	13.0	13.6
Net shipping weight	ton	0.8	1.1	2.5	3.3	3.7	7.3	8.8	10.3	12.6	13.1
Gross shipping weight	ton	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

		5/5	5/10	10/10	10/15	10/20	15/20	15/30	15/40	20/40	20/45
Cooling surface	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	ton	1.0	1.5	3.1	4.1	4.8	10.7	12.1	13.6	13.0	13.6
Net shipping weight	ton	1.0	1.3	3.2	4.0	4.6	8.8	9.7	10.5	12.6	13.1
Gross shipping weight	ton	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	30





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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