



A

SEPARATION

**EASY, GENTLE, AND
HYGIENIC DRYING**

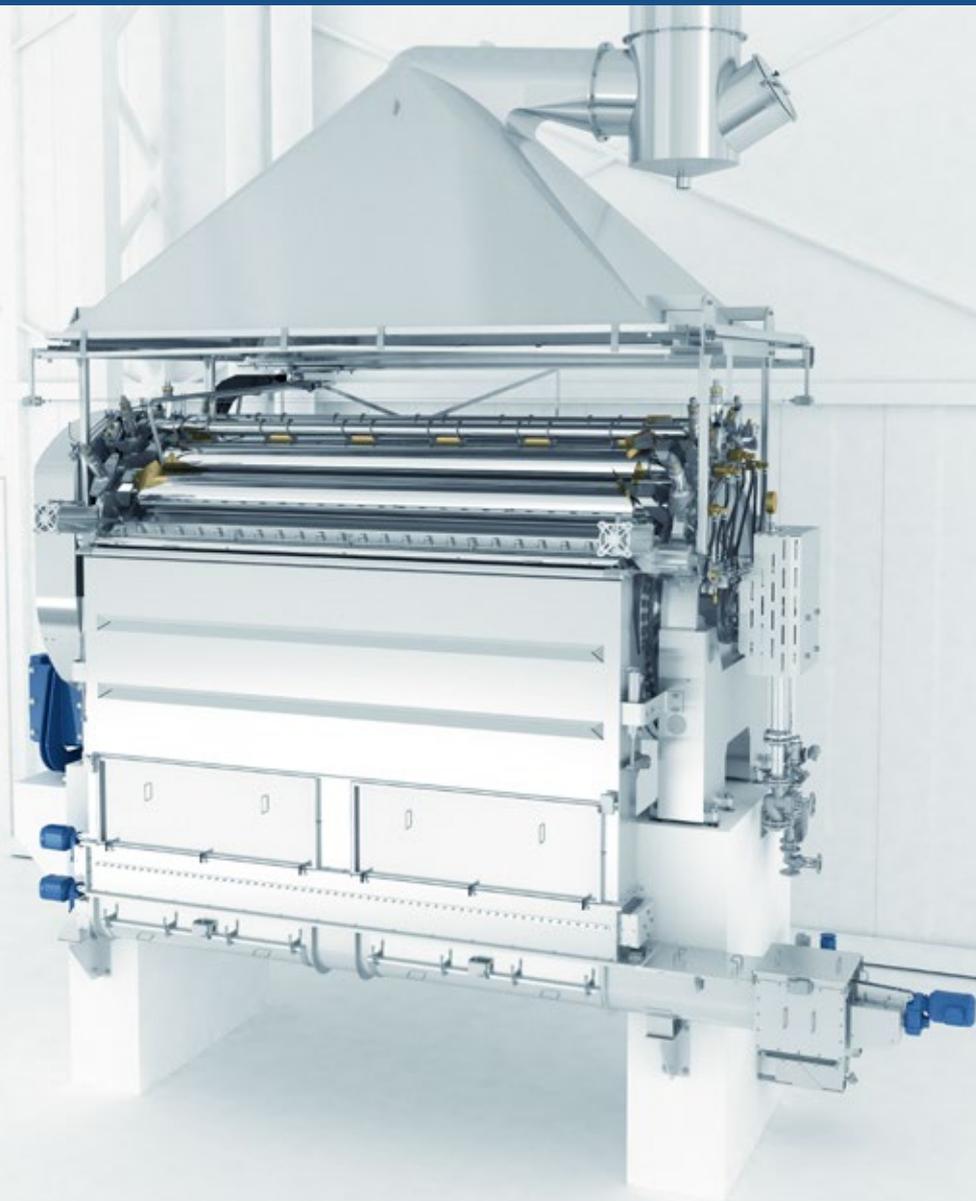
ANDRITZ GOUDA DRUM DRYER

ANDRITZ

ENGINEERED SUCCESS

The ANDRITZ Gouda drum dryer comes in various designs for all kinds of applications. Whether you need to process viscous, fluid or heat-sensitive products, steam heating from the inside provides uniform temperature distribution over the outer drum surface, which results in a product of accurate and consistent quality. From easy, hygienic baby food drying to processing of toxic material - the drum dryer is the best solution.

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.



Meeting stringent production, quality and safety parameters

When stringent production, quality and safety parameters dictate how to operate your factory processing lines, your only option is state-of-the-art equipment. The ANDRITZ Gouda drum dryer is unique for turning viscous, pasty, and sticky materials into dried powder or flakes. It is your best choice when the drying process must be as gentle as possible without strong mechanical or thermal impact.

CONTINUOUS, GENTLE DRYING

Drum drying is a continuous, indirect drying process. As the drum body rotates, it is heated on the inside by steam and very thin layer of the product to be dried is applied to the outer surface of the rotating drum. When in contact with the heated surface, the liquid evaporates very quickly from the thin product layer and then leaves the process at the top of the machine. If necessary, the vapor can also be removed by suction locally around the drum. After almost one complete rotation of the drum, the remaining dried product is scraped off the drum surface in the form of a film using a sharp knife. It is then cut into flakes or ground into powder, and transported to a cooler. From there, the end product can be brought to silos for storage and/or to a packaging machine.

A CLOSED SYSTEM

The steam condensate is removed from the drum continuously to make the largest possible surface area available for condensation of the steam on the inside of the drum. The steam system is a closed loop. This means that the product cannot come into contact with the steam or condensate. Because of the continuous, indirect drying and brief exposure to high temperature, virtually no overheating will occur. Also taste, smell, and texture qualities of the product are maintained.

SMALL FOOTPRINT

Drum drying is an environmentally friendly drying method. There is hardly any dust emission, and both energy recovery and smell abatement are possible. What is more, the compact drum dryer has a small footprint, which results in a low investment cost for the building and installation work compared to other drying technologies.

Flexible operation thanks to multiple design configurations

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

The ANDRITZ Gouda drum dryer can be designed accordingly to meet your application needs and plant requirements. Besides special materials of construction for the drum, various feed systems and automation features are also available to help process all kinds of products.

FIELD OF OPERATION

Operating principle ————— (Vacuum) contact drying

Operating mode ————— Continuous

Consistency of wet product — Pumpable wet slurry

Heat transfer medium ————— Saturated steam

Particle size ————— N.A. for wet product

Product conveying ————— Product sticking to drum surface

Heating medium temperature — 120-190 °C

Drying time ————— Between 2 seconds and 2 minutes

Materials of construction — {
Cast iron
Cast iron, chromium-plated
Cast iron, chromium-carbide coating



Ready for the future with reliable control systems for efficient operation

Our mission is to enable our customers to achieve their target figures in overall equipment efficiency, minimum production costs, transparency, and short training periods – all of which are required to give our customers peace of mind. This is especially important in the highly competitive markets our customers are dealing with – be it the food, mining and minerals, environment, or chemicals industry. And the industries are facing a new challenge – the fourth industrial revolution, based on the use of cyber-physical systems. That is what drives us in our continuous R&D efforts aimed at developing state-of-the-art technologies.

By adding Metris addIQ control systems to the ANDRITZ Gouda drum dryer, control of the production process becomes almost child's play. The intuitive operator interface for easy operation results in high availability of the equipment and in good performance. Production processes can be improved based on data acquired by the system. Technical support times are shortened through remote support with Metris addIQ Connect, where your machine or process line is connected to the secure ANDRITZ environment. The system can also be applied in existing equipment and comes in different product packages, varying from machine hydraulic control to risk analysis and safety evaluation.



Metris addIQ to control the production process



Smart adjustment control of the applicator rolls

Various designs for different operating principles

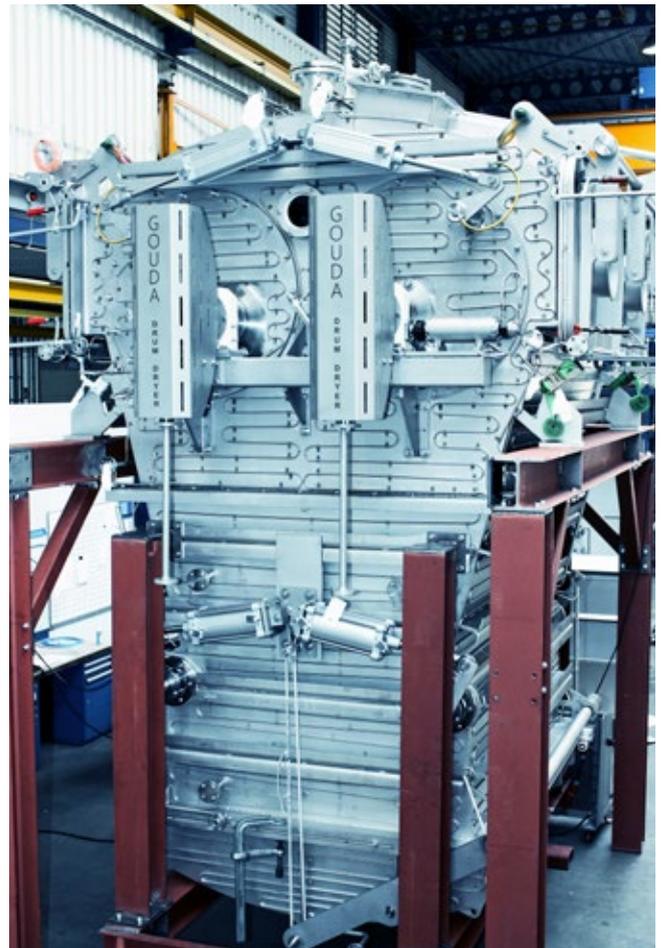
Whatever requirement you have, our product range is wide enough to respond to your specific needs. Depending on the product to be dried, you have the choice between a vacuum, single-drum or double-drum dryer.

Vacuum drum dryer

FOR YOUR HEAT-SENSITIVE PRODUCTS

If you need to keep your drying temperature below 100°C, choose the single-drum or double-drum vacuum dryer. This system revolves in a hermetically sealed casing under strong vacuum. Drying at low temperatures avoids damage to heat-sensitive products. Moreover, these dryers are extremely hygienic. There is hardly any recirculation of material and no atmospheric contamination. Since operation is totally independent of climatic conditions, results are always the same. Food products, in particular, benefit from this vacuum drying method.

No waste is produced in this system, and the drum is accessible for thorough cleaning. Additionally, vacuum dryers can be used for recovery of solvents by collecting the vapors that form during the drying process. Double vacuum dryers offer larger capacity and lower production costs.



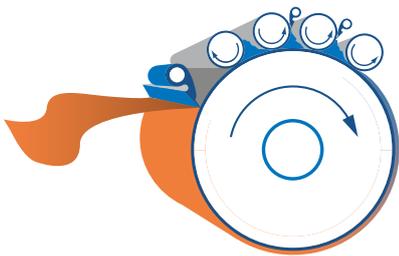


Single-drum dryer

PARTICULARLY SUITABLE FOR VISCOUS LIQUIDS

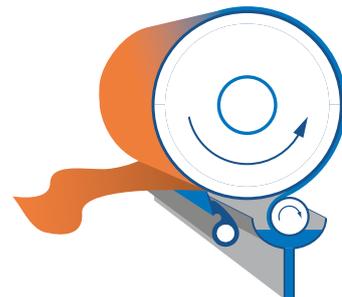
The special construction of the single-drum dryer makes it particularly suitable for processing pasty, pulpy, or sticky products. The product is continuously

applied either at the bottom or the top of the main drum, and the applicator roll system ensures perfect distribution of your product along the drum's full length.



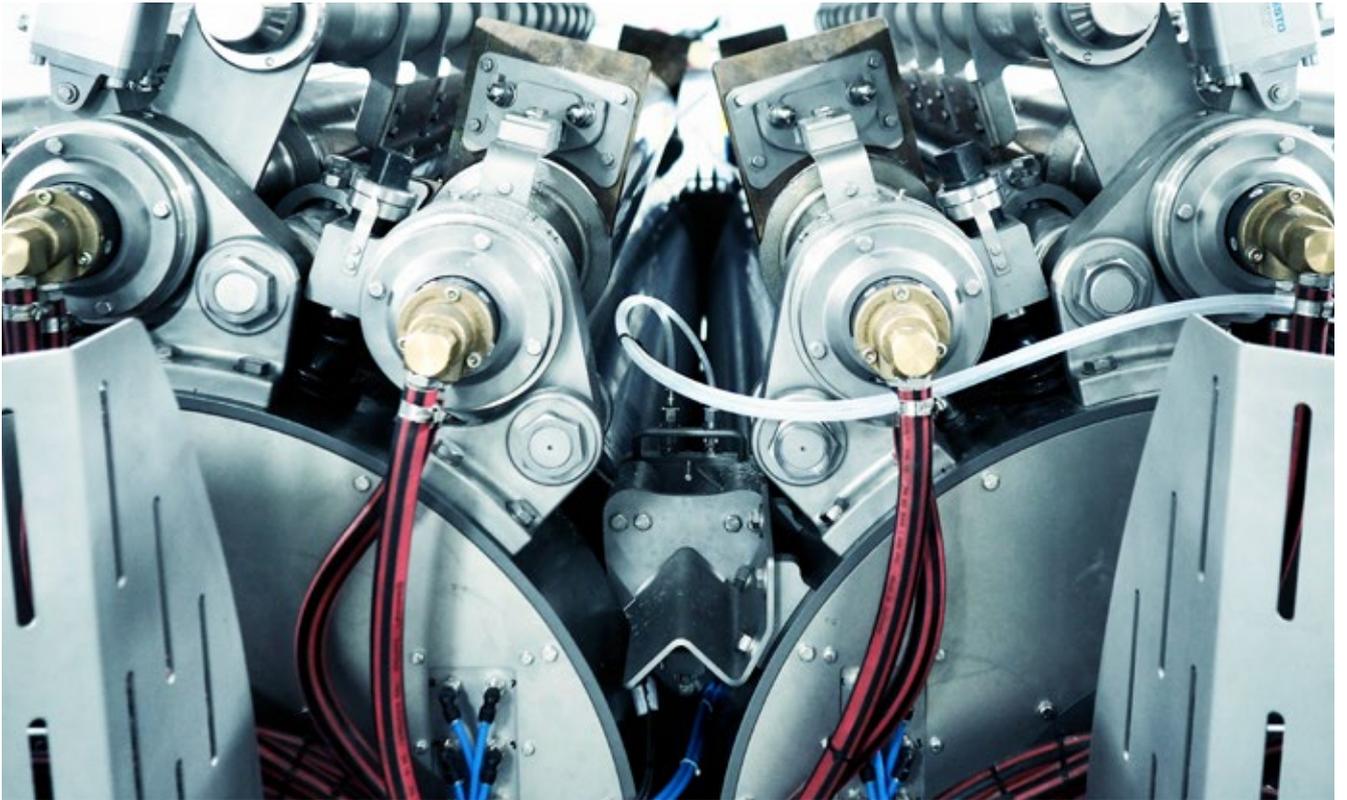
SINGLE-DRUM DRYER WITH TOP APPLICATOR ROLLS

The layer formed on the drying drum can be thicker or thinner depending on the number of applicator rolls used. The applicator rolls make it easy to regulate product feed. In addition, they have a kneading effect, preventing lump formation in stickier materials such as starch.



SINGLE-DRUM DRYER WITH BOTTOM DIP ROLL

This is a version designed for processing chemicals and for specific applications (e.g. glue), with a roll that sits underneath the drum. It dips into the product, picking up a liquid layer for transfer to the main drum.

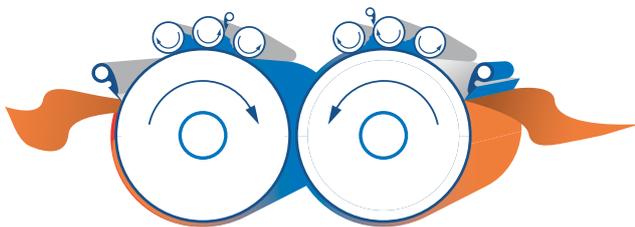


Double-drum dryer

IDEAL FOR MORE LIQUID PRODUCTS

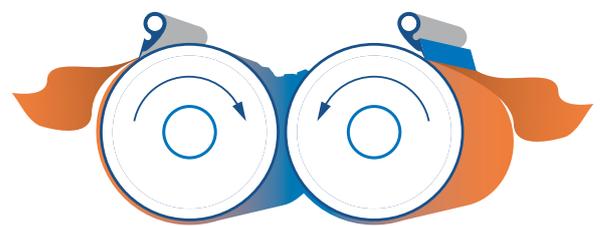
A double-drum dryer is often used for products that are thinner, with lower viscosities, for example milk. The liquid is fed from above into the sump between the two main drums, which always rotate in opposite directions. The dried product is scraped off before the drums have completed a single rotation. The small gap between

the drums can be adjusted accurately to obtain your desired film layer, with no risk of leakage at the bottom. Our double-drum dryers come with or without applicator rolls. This multifunctional set-up offers additional output capacity and the greatest of versatility.



DOUBLE-DRUM DRYER WITH APPLICATOR ROLLS

The double-drum dryer with applicator rolls is your best choice if you have a more variable product range because it combines the advantages of both the single-drum and double-drum dryer systems. The main drums can be moved apart hydraulically and, as such, can be used as two single-drum dryers with overhead applicator rolls.



DOUBLE-DRUM DRYER WITHOUT APPLICATOR ROLLS

With this system, the product is fed into the nip between a pair of drums (which always rotate in opposite directions). This small gap between the drums is precision-adjustable to optimize the film thickness.

Applications for the chemical and pharmaceutical industries

When it comes to tolerance, there can be no compromise. The durable construction of the ANDRITZ Gouda drum dryer makes light work of the most demanding operating conditions. The built-in accuracy of the system delivers correctly processed products, year after year. Chemical processes sometimes require specific settings because of the high water content in the product. In this case, a cast-iron drum is used. A chromium layer on the drum prevents discoloration of certain chemical products. Since the drying characteristics of most products are not entirely predictable, we use pilot plant testing for you to select the most efficient machine model and size.

APPLICATIONS

- Glue
- Pesticides
- Sodium and natrium benzoate
- Polymers
- Pigments
- Detergents
- Enzymes

YOUR BENEFITS

- Highest hygienic standards
- High water evaporation
- Continuous process
- Easy operation
- Compact machine



Natrium benzoate on a double-drum dryer



E15/40KD with special safety design

Applications for the food industry



Drum dryer with linear feed system

Many world-famous instant foods are made on ANDRITZ Gouda dryers. Food products may benefit especially from the vacuum drum dryer, which enables drying at low temperatures, avoiding damage to heat-sensitive products. Evaporation takes place within seconds, with no risk of oxidation. Enzymes and vitamins are preserved, and proteins are prevented from coagulating.

The final product – either in flake or powder form – is highly soluble so it can be reconstituted rapidly to a liquid. The use of drum dryers is not limited to the mere evaporation of water or solvents from a product. Certain nutritious substances can attain remarkable properties thanks to a ready-cooking effect in addition to drying.

APPLICATIONS

- Cereal-based baby food
- Cereal-based drinks
- Milk powder
- Yeast
- Starch
- Gelatin
- Potatoes
- Proteins (vegetable)

YOUR BENEFITS

- Unique taste
- Constant quality
- Very hygienic
- Highly soluble end product
- Short residence time
- Small footprint
- Vacuum options

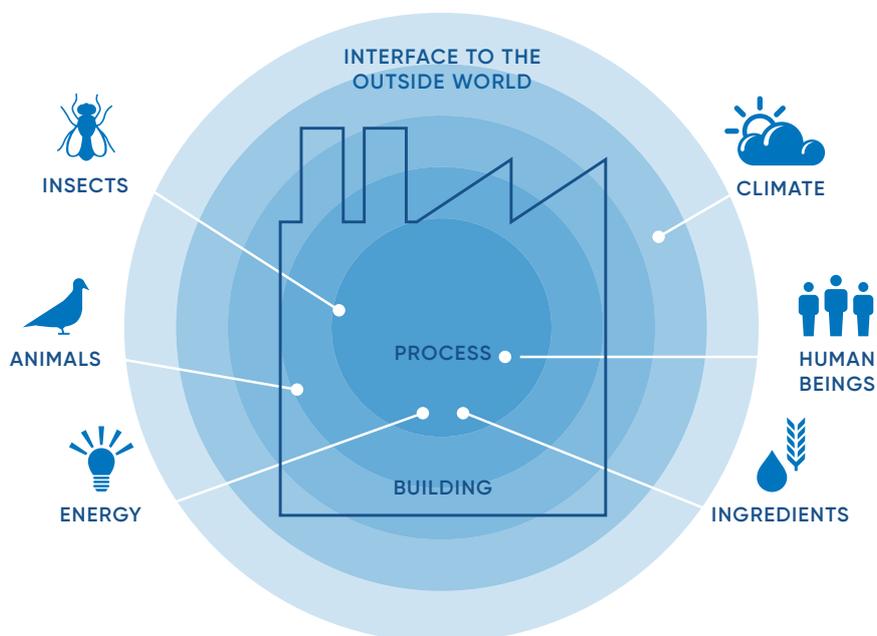
Special focus on hygiene and energy efficiency

With the ANDRITZ Gouda drum dryer, running costs are significantly lower than with other dryers. Its high thermal efficiency translates to steam consumption of approximately 1.4 kg for each kilogram of water evaporated. Drum drying is environmentally friendly as well, with low levels of dust emission, thus avoiding the need for complicated filter installations and additional waste.

Hygiene is especially important in food applications. In the design of our drum dryer, we make a clear distinction between the process section of the dryer and the mechanical parts. This prevents the risk of product contamination by lubricants, for instance, or contamination of the lubricants due to leakage of the product. It also improves the accessibility of parts for adjustment, inspection and maintenance purposes.

YOUR BENEFITS

- Increased hygienic design
- Safe and easy maintenance
- Operator independence
- Energy savings



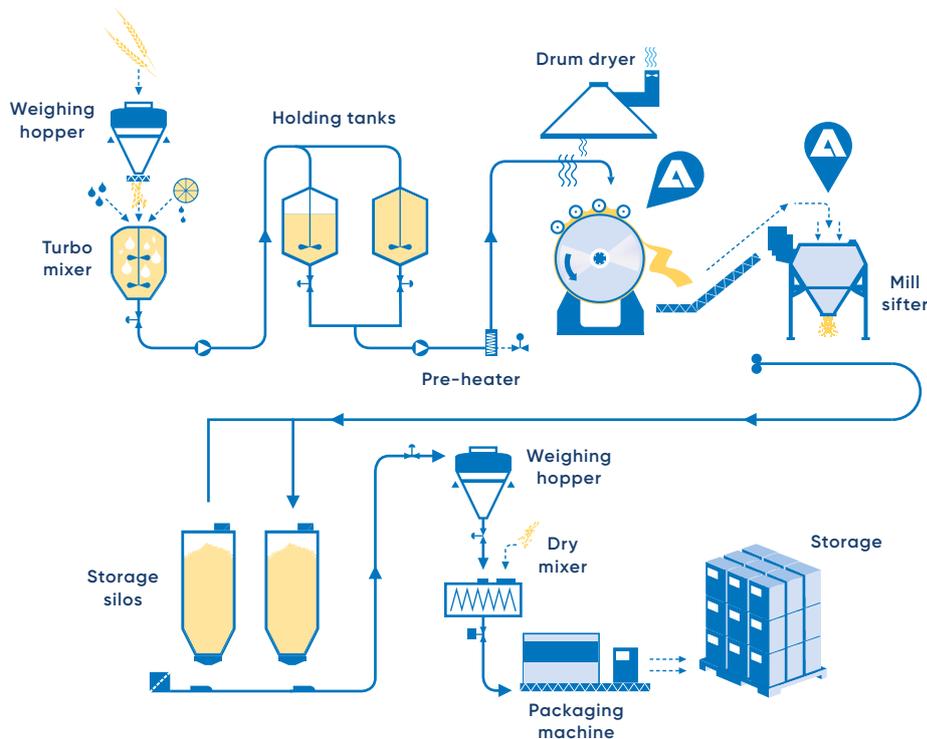
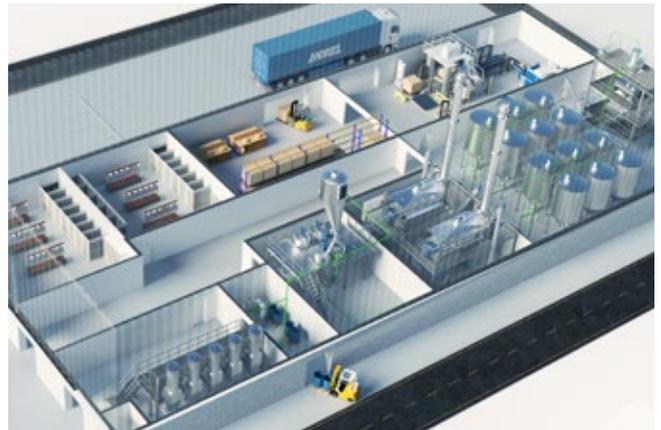
The dryer's process area is separated from its mechanical components, thus eliminating the risk of contamination.

Process solutions on demand

Tailored separation systems in response to to your application manufacturing process.

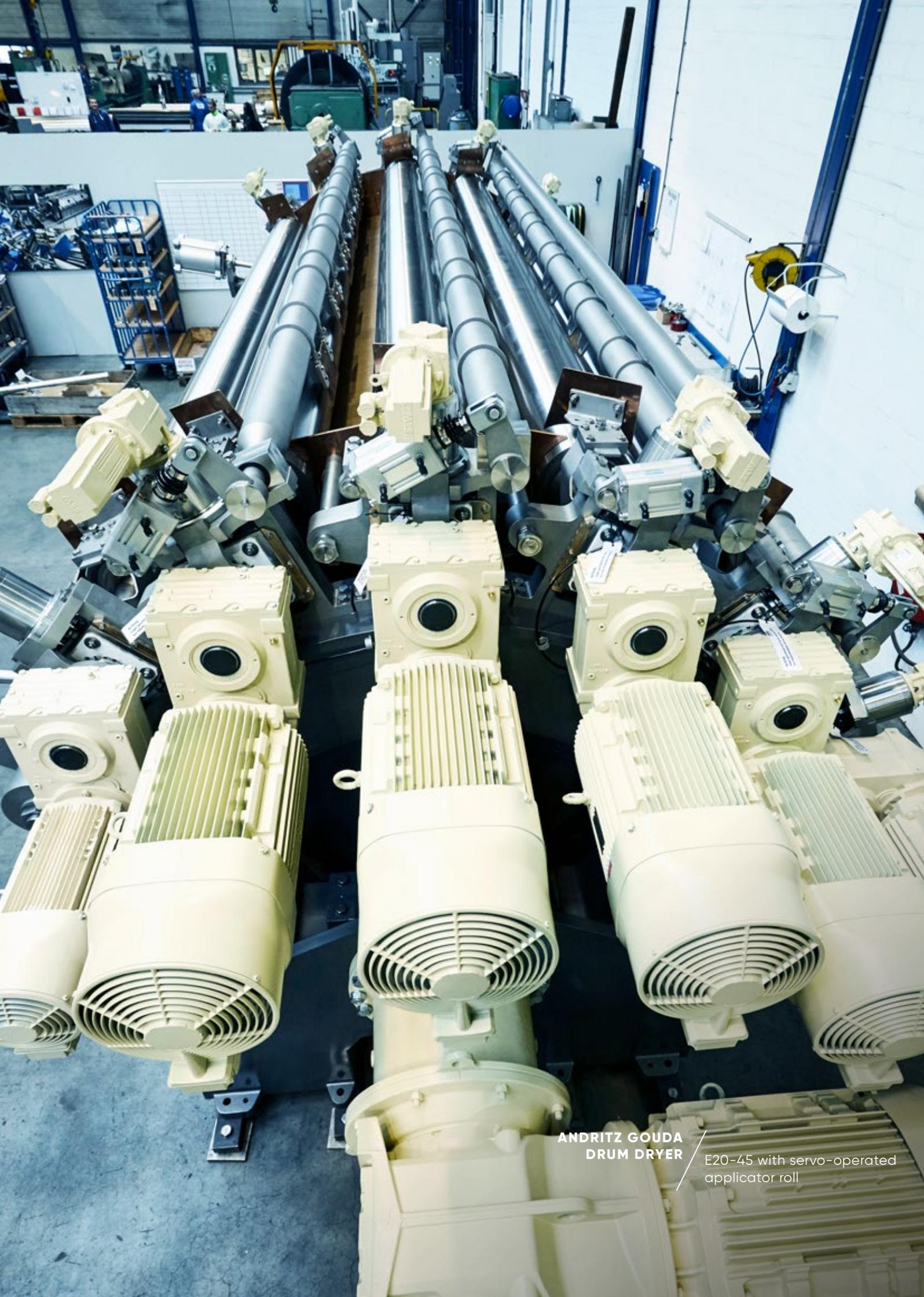
ANDRITZ creates, implements, and maintains innovative solutions, from tailored systems to improve your production unit, from an individual machine set-up to entire plants. We have the answer to all of your specific separation challenges, delivering state-of-the-art machines and peripherals for your processing line.

A ready-to-use, cereal-based baby food production line includes intake, weighing and mixing of raw materials, a drying section, a milling section, storage silos, and packaging machines. Don't hesitate to consult us, from A to Z.



Baby food drum drying process line





**ANDRITZ GOUDA
DRUM DRYER**

E20-45 with servo-operated
applicator roll

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 configurations. 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.



Pilot test on single-drum dryer

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 no complicated filter installations. And, of course, we ensure optimal hygiene throughout the processing line, allowing you to operate according to HACCP/EHEDGE standards.

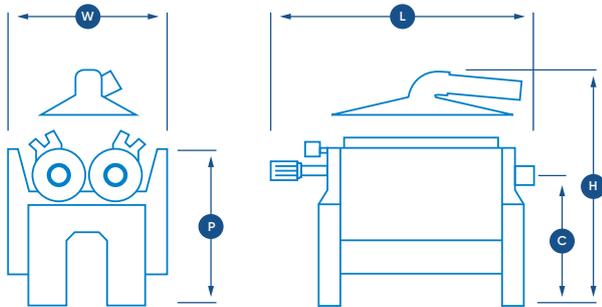
Several hundred employees work in ANDRITZ R&D centers worldwide, continuously developing innovative and customized technologies. The main focus lies on high-level environmental protection, sustainable production, and on extending the machine life cycle. We involve our R&D staff directly in project development, 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.



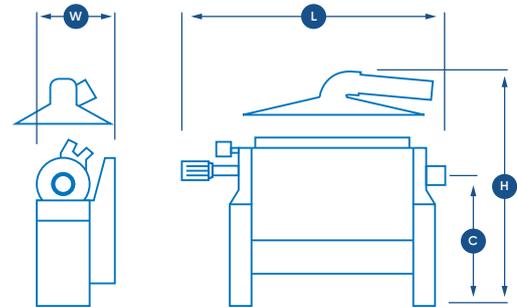
R&D testing in the pilot plant

Dimensions and models

The ANDRITZ Gouda drum dryer comes in a variety of sizes, ranging from dryers with a drying surface area of 0.75 m² up to a drying surface area of 44 m².



Double-drum dryer (T)



Single-drum dryer (E and EP)

DOUBLE-DRUM DRYER MODEL T

		5/5*	5/10*	10/10	10/20*	10/30*	15/30	15/40
Drying surface area	m ²	1.5	3.1	6.2	12.5	18.8	28.2	37.6
Drum diameter	mm	500	500	1,000	1,000	1,000	1,500	1,500
Drum length	mm	500	1,000	1,000	2,000	3,000	3,000	4,000
Number of applicator rolls	standard	0	0	0	0	0	0	0
	optional	2x2	2x2	2x2 or 2x3				
Length*** (L)	m	1.8	2.3	4.2	5.2	6.2	5.9	6.9
Width*** (W)	m	1.9	1.9	3.3	3.3	3.3	4.3	4.3
Height*** (H)	m	1.7	1.7	5.0	5.0	5.0	7.4	7.4
Platform height (P)	m			2.6	2.6	2.6	3.1	3.1
Drum heart line (C)	m	1.8	1.8	3.0	3.0	3.0	3.5	3.5
Speed range	rpm	depending on the application						
Drive power - total installed**	kW - min	4	5.5	8	15	22	37	44
	kW - max	7.5	7.5	35	35	43	100	100
Weight for foundation***	t	1.4	2.6	11.9	16.1	20.1	49.8	54
Shipping weight***	net	2	2.6	9.8	12.6	15.4	40.8	48
	gross	2.2	2.9	10.4	13.6	16.8	42	50
Shipping volume***	m ³	7	9	20	26	32	40	47

* also available in vacuum dryer design ** typical (depending on application) *** basic machine only incl. drives

SINGLE-DRUM DRYER MODEL E

		5/5	5/10	10/10	10/20	10/30	15/30	15/40	20/40	20/45
Drying surface area	m ²	0.75	1.5	3.1	6.2	9.4	14.1	18.8	25.1	28.2
Drum diameter	mm	500	500	1,000	1,000	1,000	1,500	1,500	2,000	2,000
Drum length	mm	500	1,000	1,000	2,000	3,000	3,000	4,000	4,000	4,500
Number of applicator rolls	standard	4	4	4	4	4	4	4	4	4
	optional	N/A	N/A	N/A	N/A	N/A	5	5	5 or 6	5 or 6
Applicator roll diameter	mm	120	120	220	220	220	260	260	300	300
Length** (L)	m	1.5	2	3.2	4.2	5.2	5.4	6.4	8.3	8.8
Width** (W)	m	1.2	1.2	1.8	1.8	1.8	2.5	2.5	3	3
Height** (H)	m	3.1	3.1	5.6	5.6	5.6	7.6	7.6	6.5	6.5
Platform height (P)	m			2.6	2.6	2.6	3.1	3.1	3.1	3.1
Drum heart line (C)	m	1.4	1.4	3.0	3.0	3.0	3.5	3.5	3.5	3.5
Speed range	rpm	depending on the application								
Drive power - total installed*	kW - min	4	5.5	13	20	33	34	42	55	65
	kW - max	7.5	7.5	35	35	45	75	100	130	130
Weight for foundation**	t	0.8	1.4	7.1	9.8	12.4	21	30	46	50
Shipping weight**	net	1.6	1.8	5.8	7.9	10	17.5	26.5	34	38
	gross	1.8	2.1	6	8.4	10.8	18.5	27.8	35	39
Shipping volume**	m ³	6	9	10	13	16	21	25	34	37

SINGLE-DRUM DRYER MODEL EP (for potato flakes)

		15/30	15/40	15/52	20/52	20/62	20/72
Drying surface area	m ²	13.4	18.1	23.8	31.7	38.0	44.3
Drum diameter	mm	1,500	1,500	1,500	2,000	2,000	2,000
Drum length	mm	3,000	4,000	5,200	5,200	6,200	7,200
Number of applicator rolls		5	5	5	5	5	5
Applicator roll diameter	#1 & #5	260	260	260	260	260	450***
	#2 & #3 & #4	220	220	220	220	220	325
Length** (L)	m	5.0	6.0	7.2	7.2	8.2	9.2
Width** (W)	m	3.4	3.4	3.4	3.8	3.8	3.8
Height** (H)	m	6.5	6.5	6.5	6.8	6.8	6.8
Platform height (P)	m	2.6	2.6	2.6	2.9	2.9	2.9
Drum heart line (C)	m	3.0	3.0	3.0	3.0	3.0	3.0
Speed range*	rpm	2-10	2-10	2-10	2-10	2-10	2-10
Drive power	kW	11	11	15	18.5	18.5	33.5
Weight for foundation**	t	21	30	39	58	59	60
Shipping weight**	net	17.5	26.5	36	48	56	42
	gross	18.5	27.8	37	50	48	45
Shipping volume**	m ³	21	25	37	65	74	75

* typical (depending on application) ** basic machine only incl. drives *** only last applicator roll #5



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, Guinard Centrifugation, KHD Humboldt Wedag, Krauss-Maffei centrifuges, dryers, and filters, Lenser, Netzsch Filtration, Rittershaus & Blecher, Royal GMF Gouda, Sprout Bauer, and Vandebroek.

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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