



SEPARATION

# PRODUCING QUALITY PRODUCTS WITH HIGH EFFICIENCY

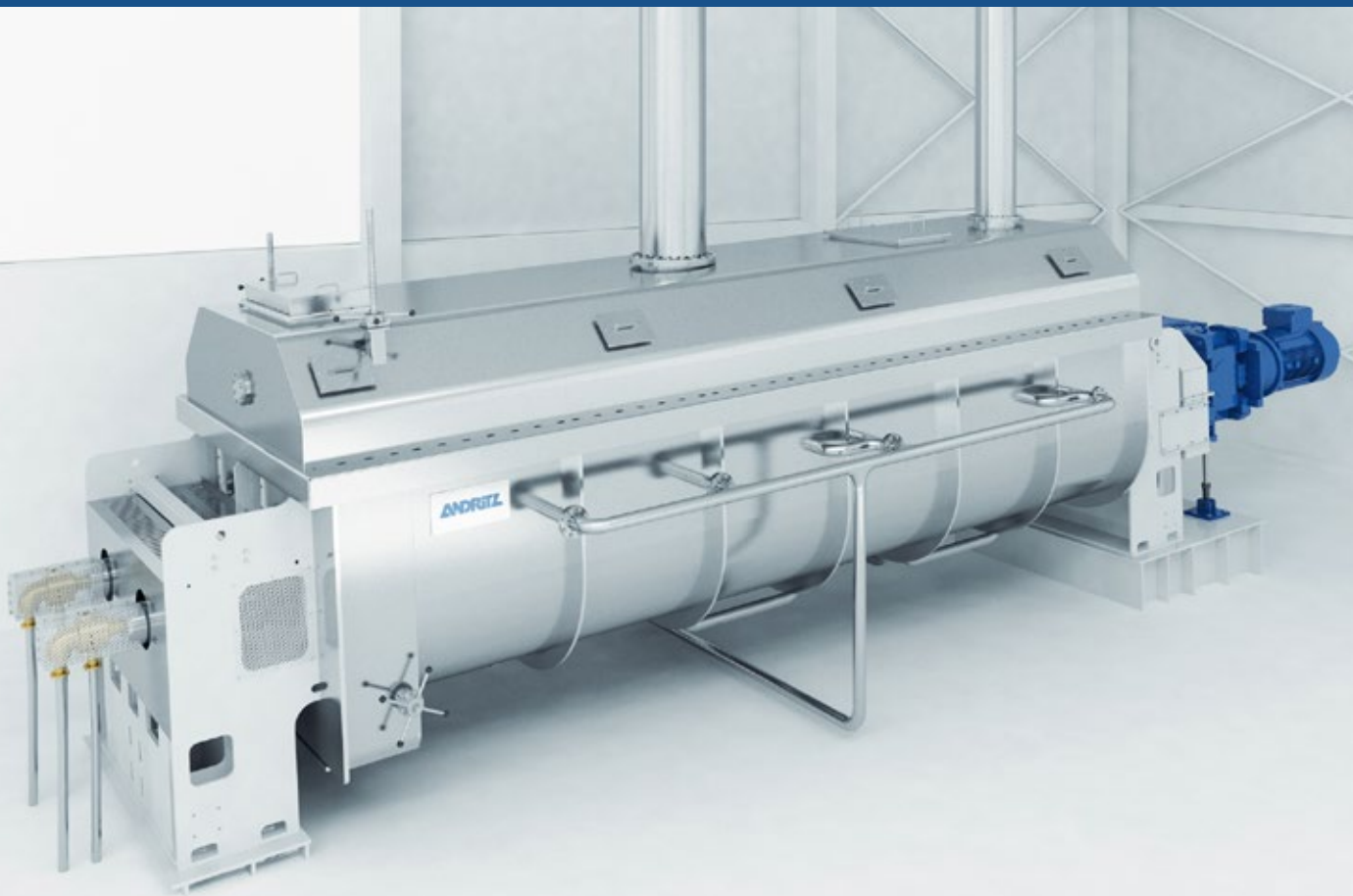
ANDRITZ GOUDA PADDLE DRYER

**ANDRITZ**

ENGINEERED SUCCESS

The ANDRITZ Gouda paddle dryer is an indirect contact dryer designed to accept a wide range of product types. Depending on your specific application, ANDRITZ offers a customized paddle dryer to suit your requirements. When you have to dry environmental sludge, for instance, the machine is subject to severe wear so it needs to be robust and durable. For food or chemical applications, it may be very important to control the product residence time. In both cases, ANDRITZ Gouda paddle dryers are designed for your specific needs.

ANDRITZ is the world's leading separation specialist, with the deepest knowledge, broadest technical resources, and most comprehensive service and automation solutions. 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.



# Keep heat transfer simple with the ANDRITZ Gouda paddle dryer

The ANDRITZ Gouda paddle dryer is a technology that has a lot to offer. It is used for drying sewage sludge or for heat treatment of powders, granulates or pasty products in a continuous chemical drying process. The dryers are designed for a long and continuous life cycle and handle products with the required care – even toxic materials. For products in the food industry sensitive to heat or oxygen, we have developed a vacuum model of our paddle dryer.

## THE MOST VERSATILE DRYING SYSTEM

The paddle dryer has references in the following processes:

- Drying
- Heating
- Cooling
- Reacting
- Roasting
- Cooking/braising
- Calcining
- Sterilizing
- Melting
- Solvent stripping
- Vacuum drying

## STATE-OF-THE-ART COMPONENTS

The continuous set up with indirect heat transfer within the paddle dryer's state-of-the-art interior, produces quality products with high efficiency that require only a minimum of maintenance. The paddles on the rotating dryer shafts are specially shaped to ensure maximum heat transfer to the product.

## WEDGE-SHAPED PADDLES

Two counter-rotating paddle shafts in a heated trough ensure very high heat transfer and optimum mixing. The heat transfer medium (steam, thermal oil, or cooling water) flows through the hollow paddle shafts. This results in excellent temperature control in the product, enabling a uniform product quality. The shafts are precisely aligned: the paddles interweave as they turn, creating the ideal surface-to-product contact and plug flow, as well as the perfect process environment. The unique paddles designed in a wedge shape are self-cleaning and make it possible to treat products that are highly viscous.

## SMALL FOOTPRINT

Today, our customers are asking for environmentally friendly, energy-saving, and compact process solutions. With our paddle dryers, we do respond to these concerns. Moreover, the fully enclosed machines enable safe treatment of toxic, noxious and flammable products. Limited odor emissions, easy solvent recovery, and recovery of useful energy are also possible.

# A robust design with high wear resistance for the environment industry

The ANDRITZ Gouda paddle dryer is very suitable for sludge drying. The long product retention time in the dryer treats the sludge under hygienic conditions, creating Class A biosolids. With the federate and the energy input you can manage the residual moisture level of your final product.

ANDRITZ supplies complete solutions for sludge dewatering and drying. We can also provide plant engineering services. Our drying lines normally include:

- a wet sludge handling system
- a paddle dryer
- a dry sludge handling system
- a vapor treatment system

Nevertheless, each processing line can be customized to your specific requirements. Upon simple request, we design solutions for various applications.

## **ENVIRONMENTALLY FRIENDLY USE OF DRIED SLUDGE**

Wastewater treatment facilities create a large amount of sludge. The disposal cost of this waste product is high and handling is labor-intensive. Drying reduces the stream volume by a factor of 4 to 5, hence minimizing the disposal costs. Drying will increase the calorific value of the sludge, transforming it into a valuable product.

This product, the biosolids, can be used as fertilizer, soil improver or as biofuel suitable as an alternative energy source can be used in the cement industry for example.

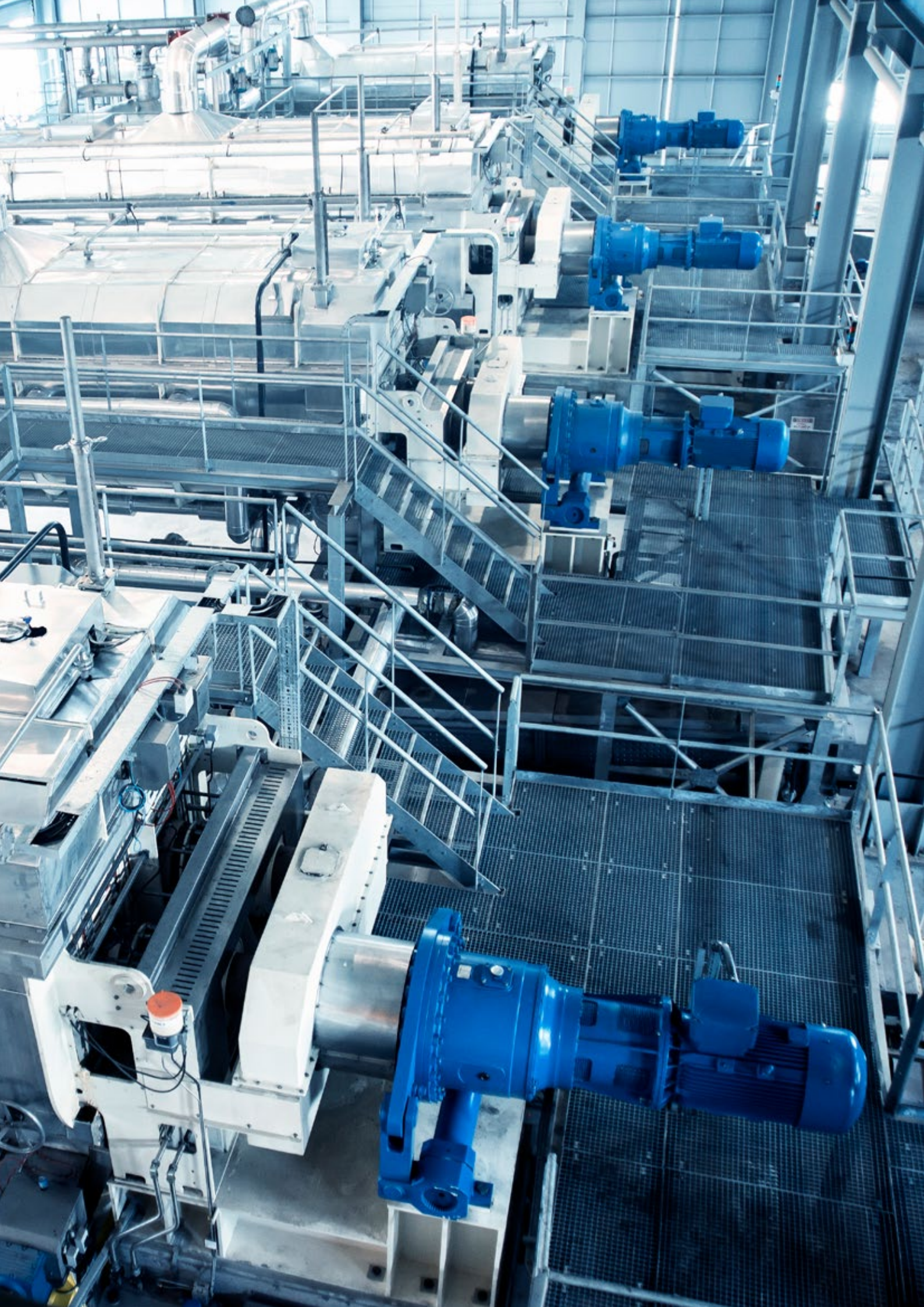
## **ENVIRONMENTAL APPLICATIONS**

- Municipal sludge
- Industrial sludge
- Paper sludge
- By-product valorization (spent coffee grounds)

## **YOUR BENEFITS**

- Constant plug flow
- Flexible for different sludges
- Once-through – no back-mixing required
- Pure vapor flow – no sweep gas required
- TÜV Nord certification
- Compliant with ATEX/NFPA legislation







# A modular paddle design or narrow residence time for the chemical industry

The fully enclosed ANDRITZ Gouda paddle dryer guarantees safe treatment of chemical products. And we intentionally manufactured a gas-tight dryer to prevent solvents from escaping. Solvent recovery is enhanced by keeping the solvent concentration in the exhaust vapor as high as possible.

## EASY-ACCESS COVER

One of the unique features of this paddle dryer is its dust-tight cover with eyehole and special lid for taking samples. The cover is heat treated to avoid condensation of vapors.

## MODULAR DESIGN

The ANDRITZ Gouda paddle dryer comes in a variety of configurations. For example, two different heat zones are possible if needed. We also have a vacuum model, allowing drying temperatures to be kept low for heat-sensitive food products. For crystallizing and drying PET, a special version is available to ensure degradation-free processing and a very short residence time. Whatever the model, the entire unit is on a slight incline, enabling a good flow of product particles by gravity.

## SPECIAL FOCUS ON RESIDENCE TIME

The paddles in the ANDRITZ Gouda paddle dryer provide excellent mixing in radial direction. The product is pushed by the feed in axial direction, gradually achieving its final properties. Even plug flow through the machine ensures that each product has a similar residence time. It is important to know that you are able to modify the residence time according to your product specification.

## CHEMICAL APPLICATIONS

- Polymers (PET, SAP, PA)
- Gypsum
- Minerals
- Metal powders
- Lithium

## YOUR BENEFITS

- Continuous process
- Customization possible
- Even plug flow
- High capacities
- High heat transfer
- No sweep gas required
- Two temperature zones possible
- Low temperature possible (vacuum)
- Variable incline of the entire unit

# A polished shaft or trough, adaptable to your demands for the food industry

For food applications, the ANDRITZ Gouda vacuum paddle dryer is the better option, especially because of its hygienic design specifications. To prevent cross-contamination, the product contact parts are surface-treated, for example polished or coated. The machine design pays special attention to accessibility for cleaning purposes.

## DUST-TIGHT COVER

The ANDRITZ Gouda paddle dryer's dust-tight cover can be adapted for full vacuum or overpressure with a modified feed and product removal system. Because the cover is heat-treated, there is no condensation of vapors inside the dryer.

## VARIOUS DESIGNS

For food applications, the ANDRITZ Gouda paddle dryer is manufactured to hygienic design specifications. The product contact parts are surface-treated, for example polished or coated. Special attention is given to ensuring accessibility for cleaning purposes. In response to the requirements of our clients in the food industry, the paddle dryer comes in a variety of configurations:

- Vacuum
- Two different heat zones
- Customized product feed/extraction
- Variable angle of inclination

## FOOD APPLICATIONS

- Milk powder
- Starch
- Cocoa
- Flour
- Sugar
- Hazelnuts
- All powders/granules

## YOUR BENEFITS

- No sweep gas
- Plug flow
- Low temperature possible due to vacuum
- Dry process
- Hygienic design

# Flexible operation thanks to multiple design configurations

The ANDRITZ Gouda paddle dryer design has been enhanced in cooperation with global companies to best meet the demanding requirements of production plants in different industries.

The ANDRITZ Gouda paddle dryer can be designed to handle chemical or even toxic material with the utmost care, but it can also be designed to handle pasty and heavy products like sludge. For heat or oxygen sensitive products we have developed a vacuum execution of the paddle dryer.

## FIELD OF OPERATION

Operating principle — (Vacuum) contact drying

Operating mode — Continuous

Consistency of wet product — ☐ Pumpable wet slurry  
☐ Free-flowing powders

Heat transfer medium — ☐ Saturated steam  
☐ Thermal oil

Particle size — N.A. for wet product

Product conveying — Plug flow by push feed

Heating medium temperature — 10–250 °C

Drying time — 30–360 minutes

Materials of construction — ☐ Stainless steel  
☐ Tungsten-carbide coating



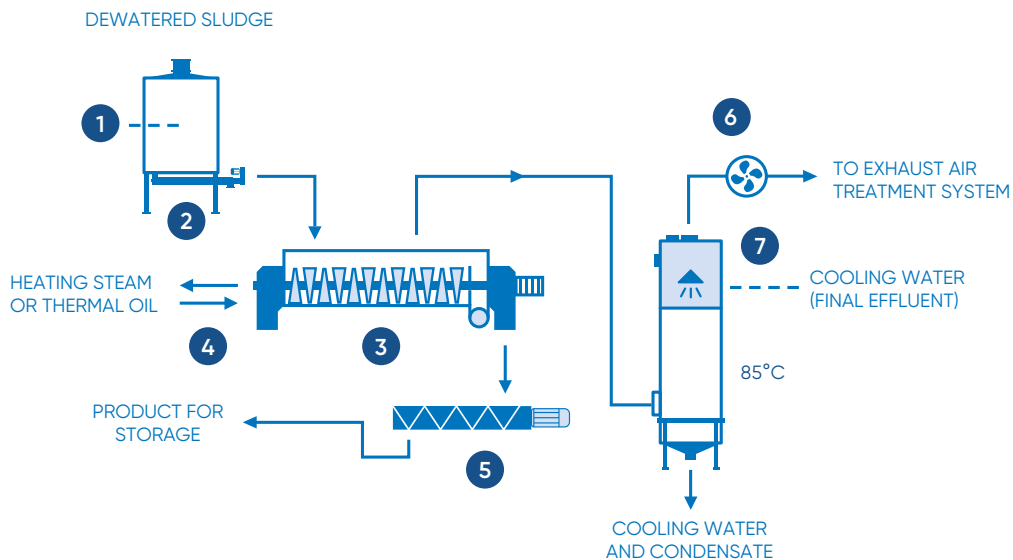
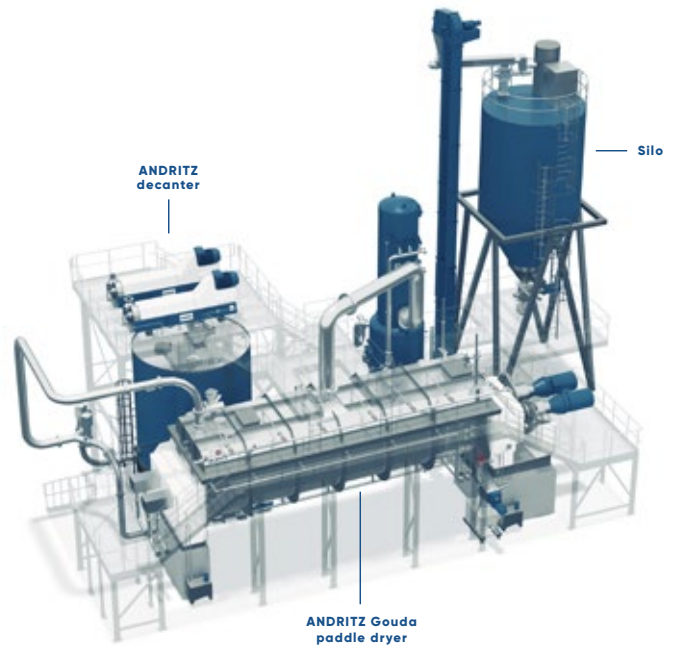


# Process solutions on demand

Tailored separation systems in response to your application manufacturing process.

ANDRITZ creates, implements, and maintains innovative process solutions, from tailored systems to improve your production unit 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 processing line may consist of multiple ANDRITZ machines, for instance a paddle dryer for drying combined with a decanter for dewatering and a screen for filtration.



- 1 Wet sludge silo 2 Wet sludge pump 3 ANDRITZ Gouda paddle dryer 4 Steam or thermal oil supply 5 Product cooler  
6 Exhaust gas fan 7 Condenser

Sludge drying process with an ANDRITZ Gouda paddle dryer



# 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 plant on-site tests



# 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.

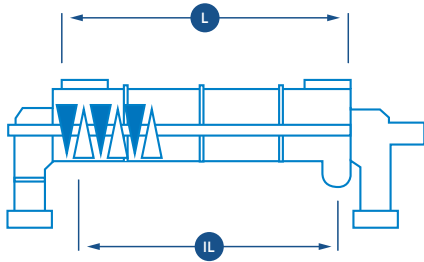
Several hundred employees work in ANDRITZ R&D centers worldwide, continuously developing innovative and customized technologies. The main focus lies on high-level environmental protection, sustainable production, and on extending the machine life cycle. We involve our R&D staff directly in project development,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



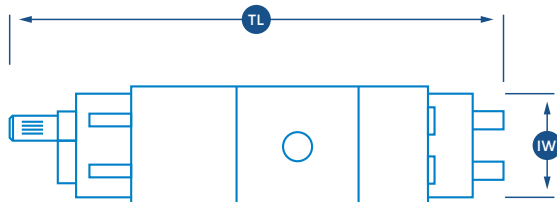
Automated operation systems

# Dimensions and models

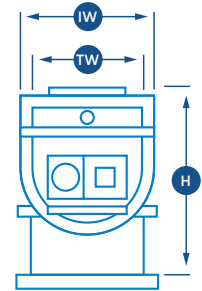
The ANDRITZ Gouda paddle dryer comes in a variety of sizes, from a heat transfer area of 3 m<sup>2</sup> up to almost 300 m<sup>2</sup>.



Side view



Top view



Front view

Type of paddle dryer	TL	L	IL	TW	IW	H	D paddle	Heated area	Effective product volume	Paddle shaft speed
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[m <sup>2</sup> ]	[m <sup>3</sup> ]	[rpm]
GPD 1.6W3	3,550	2,230	2,035	630	300	1,680*	160	3.2	0.07	40
GPD 3W6	4,000	1,910	1,635	1,100	600	1,300	300	6.0	0.21	22
GPD 3W9	4,700	2,625	2,350	1,100	600	1,300	300	8.7	0.30	22
GPD 5W12	5,400	2,300	2,010	1,500	930	1,800	500	12.2	0.72	14
GPD 5W18	6,560	3,250	2,950	1,500	930	1,800	500	18.1	1.06	14
GPD 6W25	7,200	3,660	3,255	1,600	1,105	2,000	600	25.4	1.64	11
GPD 6W32	8,100	4,500	4,100	1,600	1,105	2,000	600	32	2.05	11
GPD 8W40	8,140	4,350	4,050	2,100	1,475	2,600	800	41.2	3.24	9
GPD 8W50	9,100	5,300	4,900	2,100	1,475	2,600	800	51.4	4.02	9
GPD 10W65	9,800	5,150	4,700	2,600	1,855	3,200	1,000	65.0	5.83	7
GPD 10W80	11,000	6,320	5,900	2,600	1,855	3,200	1,000	81.9	7.29	7
GPD 12W100	11,370	6,575	6,130	2,900	2,200	3,400	1,200	103.4	10.09	6
GPD 12W120	12,370	7,575	7,100	2,900	2,200	3,400	1,200	120.5	11.67	6
GPD 14W155	13,500	7,900	7,400	3,600	2,570	3,800	1,400	152.9	16.42	5
GPD 14W190	15,250	9,700	9,150	3,600	2,570	3,800	1,400	190.2	20.26	5
GPD 17W240	15,325	9,090	8,440	4,200	3,130	4,400	1,700	241.1	29.06	4
GPD 17W300	17,250	10,995	10,000	4,200	3,130	4,400	1,700	287.4	34.41	4

# 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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