



FLEXIBLE MIXING AND DRYING

ANDRITZ Gouda helix dryer

ANDRITZ

Do you require equipment with particular features to process different product consistencies? Stop searching. The ANDRITZ Gouda helix dryer can be tailored to meet the demanding requirements of your chemical, pharmaceutical or multi-purpose production plants. From friable bulk goods to sticky pastes, it is a gentle and efficient dryer.

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.



Your high-performance, multi-purpose batch dryer

Gentle and efficient drying are crucial requirements in modern production plants for chemical or pharmaceutical products. Other prerequisites are maximum flexibility, minimum product loss, contamination-free product handling, and fully automated cleaning. The ANDRITZ Gouda helix dryer has it all.

From friable bulk goods to sticky pastes, our ANDRITZ Gouda helix dryer can handle many products. The variable speed drive of the helical mixer – a top-driven, central agitator – allows maximum flexibility and optimizes the mixing process for different materials. One dryer for multiple products and multiple purposes. Thanks to its fully automated cleaning cycle, the ANDRITZ Gouda helix dryer is perfectly suited to multi-purpose production plants. The cleaning process takes place between batches and guarantees contamination-free product handling. By heating the vessel wall – and optionally the mixer as well – the ANDRITZ Gouda helix dryer becomes a high-performance contact dryer for thermal solid/liquid separation at low temperatures, known for its gentle yet efficient heat transfer. The steep vessel wall in combination with central product discharge at the bottom provides fast, easy emptying with minimum product retention.

MAIN APPLICATIONS

- Active Product Ingredients (APIs)
- Antibiotics
- Amino acids
- Fine chemicals
- Food
- Pharmaceutical intermediates
- Agrochemicals
- Dyes, pigments
- Precious metals

YOUR BENEFITS

- Gentle processing
- Optimum discharge of product
- Easy access for inspection
- High thermal transfer

Improved product handling

The ANDRITZ Gouda helix dryer is not only a flexible, multi-purpose batch dryer. It has many more advantages to offer you. Improved processing, high heat transfer rates, maximum product discharge, and fully automated cleaning are just some of the latest generation's design benefits.

GENTLE PROCESSING

Constant movement and lifting of the product along the heated vessel wall and continuous backflow into the center of the vessel ensure efficient and, at the same time, gentle mixing. Combined with small clearances between the helical blade and the vessel wall, this results in high heat transfer to the product while preventing agglomerates from forming or deposits from building up. The shear forces arising are minimal with this kind of mixing as the circumferential speed of the helical mixer is low. The variable speed drive allows maximum flexibility and optimizes the mixing process for different materials.

MAXIMUM PRODUCT DISCHARGE

A central outlet in the lowest section in combination with a steep vessel wall ensures almost complete product discharge by gravity while the mixer is running. In addition, the specially shaped helical blade is designed for minimum product retention throughout the agitator.

NO PRODUCT CONTAMINATION

The shaft seal (lip sealing or mechanical sealing) is located outside the product area, preventing any cross-contamination or extreme wear. The drive and bearing assemblies are completely separated from the process area. This allows easy maintenance without having to enter the vessel. If required, large dryers can be accessed for inspection and maintenance via wide manholes in the cover.

FULLY AUTOMATIC CIP

CIP (cleaning-in-place), allows fully automatic cleaning without opening the vessel. Spray devices in the vessel cover and at the internal fixtures ensure that all internal surfaces are cleaned properly with cleaning fluid. The cleaning process takes place between batches, which makes the ANDRITZ Gouda helix dryer perfectly suited for your multi-purpose production chains.

VACUUM CONTACT AND FINAL DRYING

The design of the ANDRITZ Gouda helix dryer has all the advantages of vacuum contact drying, such as low thermal load in the product, high thermal efficiency, safe processing of explosive substances, and simple solvent recovery. When drying down to the ppm (parts per million) range, a carrier gas can be introduced optionally through a special deodorizing nozzle directly above the product discharge.



Sight glass for product visual

Flexible operation thanks to multiple design configurations

The ANDRITZ Gouda helix dryer design has been enhanced in cooperation with renowned European pharmaceutical companies.

It can be designed accordingly to meet your application needs and plant requirements. Besides special materials of construction, high-temperature and over-pressure design, specific features are also available that help to process all kinds of product consistencies.

FIELD OF OPERATION

Operating principle

- Vacuum contact drying
- Mixing
- Overpressure reactions possible if required
- Full emptying
- Automatic cleaning

Operating mode

Batch-type

Consistency of wet product

- Free-flowing powders
- Pasty or sticky filter cakes
- High-viscosity slurries

Heat transfer medium

- Water
- Steam
- Thermal oil

Particle size

Up to 5 mm

Product conveying

Mechanical, by integrated helical mixer

Drying temperature

150 °C (optionally higher)

Drying time

20 minutes up to several hours

Materials of construction

- Stainless steel
- Nickel-based alloys
- Special materials

Lower operating costs and improved product quality

The patented vessel design and top-driven helical mixer allow you to increase the throughput, intensify the process and reduce your energy costs. Some of the unique selling points of the ANDRITZ Gouda helix dryer are described here below.

ROBUST DESIGN

Compared to the traditional design, the overall height of the ANDRITZ Gouda helix dryer is reduced significantly (~25%) because of the patented, conical-conical vessel shape. The special shape results in a shorter mixer shaft, providing a more robust design, which is helpful when you need to mix sticky products. Also, it simplifies installation in areas with limited space.

SAMPLING

A piston valve is located in the lower area of the vessel so that product samples can be taken during the drying process. The residual moisture can be analyzed in the customer's lab.

MIXING OF PASTY PRODUCTS

Processing of pasty products is possible thanks to the installation of a fast-rotating chopper in the lower area of the vessel. It also prevents lump formation during drying.

ENLARGED HEAT TRANSFER AREA

Optionally, the upper helix blade and the shaft can also be heated to enlarge the overall heat transfer area and prevent condensation on machine parts above the product filling level.

OPTIMUM BLENDING

The conical-conical vessel shape eliminates areas with poor blending characteristics in the lower part

of the vessel. In addition, the special steep, vertically inclined agitator shape allows you to process products with poor rheological properties. Combined with a 90° angle towards the vessel, the vertical incline of the helix blade ensures complete emptying of the machine, even for products with strong bridge-building characteristics.

WIDE PRODUCT RANGE

ANDRITZ Gouda helix dryers are mainly operated as vacuum contact dryers, but sometimes also as reactors. The product range contains dryers of all sizes as well as smaller mobile units for your laboratory or pilot operations. With this wide product range, we accommodate individual demands and offer tailor-made solutions.

COMPLETE SOLUTION

A variety of peripherals are available for optimum operation of your ANDRITZ Gouda helix dryer, and they meet the most demanding requirements: integrated or top-mounted dust filter, isolation valves without dead spots for filling, discharge, and sampling, CIP spraying devices, purge gas systems, vacuum skids, heating/cooling units, and solids handling systems, all with a modular design. In combination with our Krauss-Maffei peeler centrifuges HZ, complete solution packages can be provided for mechanical and thermal separation tasks, especially in the chemical and pharmaceutical industries.





ANDRITZ Gouda helix dryer for lower operating costs and improved product quality

More flexibility with the mobile ANDRITZ Gouda helix dryer

Processing product batches in series or transferring products from one process step to the next may lead to product loss or contamination.



Filling, transport and product discharge with one single mobile dryer.

Our mobile ANDRITZ Gouda helix dryer provides the answer to these operating issues. The most important benefit of using a smaller, mobile version of the ANDRITZ Gouda helix dryer is the flexible process set-up. The mobile design is available for fork-lift transport or for manual transportation on wheels. If required by your plant layout (i.e. for laboratory or pilot-plant operation), the dryer can be used as a transport vessel. As such, filling, drying, discharging, and cleaning can be performed at different locations. In addition, the use of special containment docking systems prevents any contamination of the product or the environment. A typical process set-up is as follows: The mobile ANDRITZ Gouda helix dryer is connected directly to the solids discharge of a peeler centrifuge. After charging the dryer, the closed vessel is moved on wheels or via fork-lift truck from the centrifuge to a central drying station. Here, the dryer is docked to the drive unit, the vacuum skid, and the heating/cooling unit. The whole process is safe, sterile and extremely flexible. Mobile dryers

are available up to a useful volume of 150 liters. As an option, we supply the cover of mobile units with a hinge that allows the lid to open fully. It enables full inspection of all vessel parts wetted by the product.

YOUR BENEFITS

- Flexible operation
- Contamination-free product handling
- Reduced product losses as fewer process steps are needed



Mobile ANDRITZ Gouda helix dryer
for flexible operation

Fast and efficient solvent recovery for cleaner and higher yield battery recycling

The ANDRITZ helix dryer is specifically engineered to solve one of the biggest challenges in modern Lithium-Ion Battery (LIB) recycling: removing both low and high boiling solvents from heterogeneous shredded materials – safely, efficiently, and with consistently high purity. Its vacuum, indirect heating process ensures high recovery rates, uniform drying, and clean discharge, even when processing complex pouch and prismatic cell fractions.

Designed together with professionals from the industry, the helix dryer combines safety, optimal mixing, excellent heat transfer, and complete product discharge thanks to its helical agitator. Creating an inert atmosphere prior to filling improves the safe handling of the material. Operating under vacuum, the system delivers energy efficient evaporation, recovering low and high boiling electrolytes while keeping all materials safely contained through its integrated filter and minimizing foil attrition.

Helix dryer installations support up to 4 t/h processing lines with solvent removal rates up to 99.5%, enabling safer downstream handling and higher blackmass quality. The batch-based setup offers unmatched flexibility to handle diverse battery chemistries, feedstock variations, and evolving recycling requirements. The batch-based setup offers unmatched flexibility to handle diverse battery chemistries, feedstock variations, and evolving recycling requirements.



GHD LIB for solvent removal

YOUR BENEFITS

- Up to 99.5% solvent removal (low and high boiling electrolytes) for safer processing and improved product purity
- Energy efficient vacuum drying reduces operational costs and mitigates thermal risk
- Optimal product mixing and uniform quality via helical agitator and indirect heating
- Full discharge, minimal product loss thanks to smart design and integrated filtration
- Flexible batch processing suitable for all types of LIB batteries
- Highest safety standard due to filling under inert atmosphere and vacuum drying

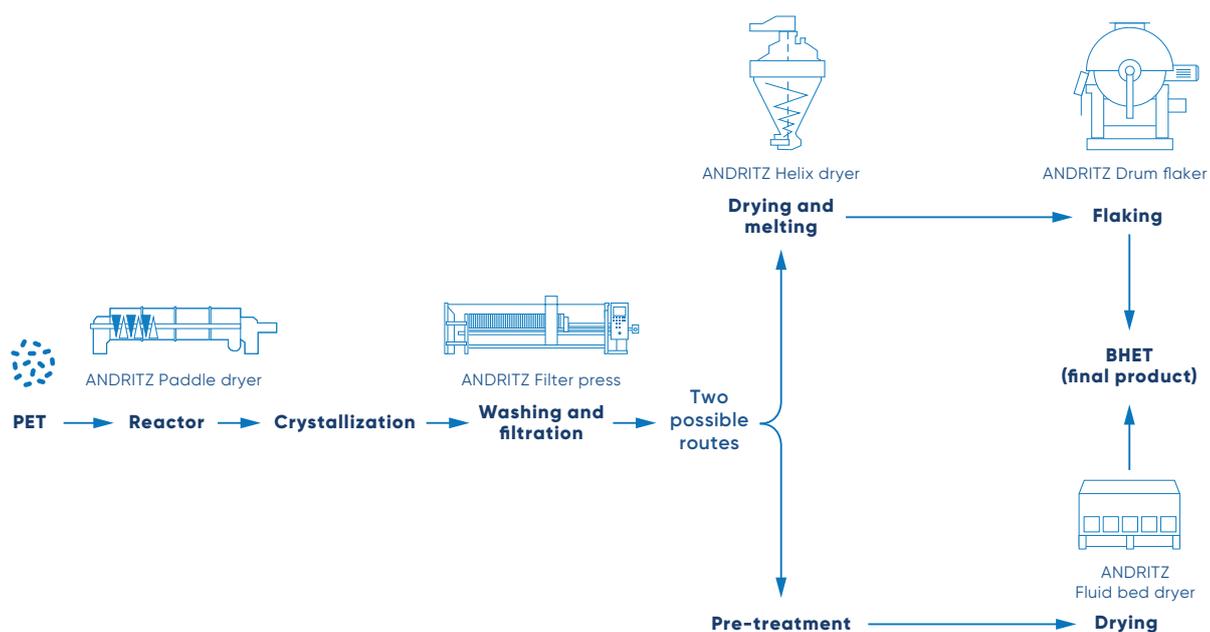
Process solutions on demand

Tailored separation systems in response to your application manufacturing process needs

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



Helix dryer process for the pharmaceutical industry



Helix dryer for drying and melting in a PET recycling process

Reliable upscaling and viability confirmation

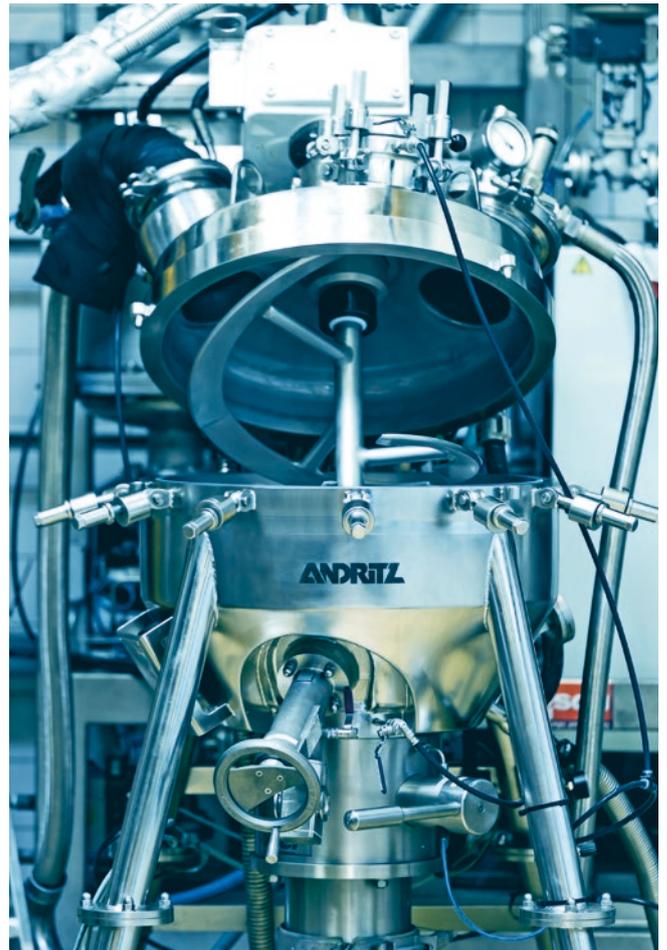
With the ANDRITZ pilot plant – a valuable test center – we can reliably scale up to industrial sizes and confirm the viability of new processes.

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.



ANDRITZ Gouda helix dryer pilot machine

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.

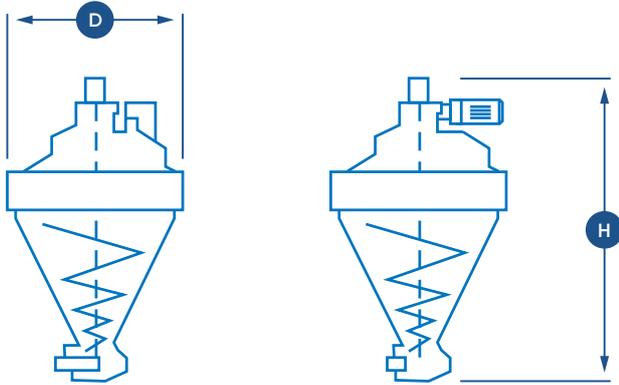
Several hundred employees work in ANDRITZ R&D centers worldwide, continuously developing innovative and customized technologies. The main focus lies on high-level environmental protection, sustainable production, and on extending the machine life cycle. We involve our R&D staff directly in project development, 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 following ANDRITZ Gouda helix dryer models are available to cover a wide range, from lab equipment to pilot units to industrial-scale machines.



GHD model	Size (liter)	Diameter [m]	Height [m]	Heating surface [m ²]	Drive power* [kw]	Weight [kg]
Pilot	8	0,40	N/A	0.16	0.35	120
Mobile	50	0,68	N/A	0.56	1.5	600
	100	0,90	N/A	0.84	2.2	800
	150	1.00	N/A	1.11	3	1,000
Industrial	200	1.10	0.65	1.41	3	1,100
	300	1.20	1.05	1.75	5.5	1,200
	500	1.40	1.25	2.53	7.5	2,100
	800	1.60	1.42	3.46	9	2,500
	1,000	1.75	1.50	4.1	11	2,800
	1,500	1.95	1.55	5.41	15	3,000
	2,000	2.10	1.60	6.61	18.5	3,300
	3,000	2.40	1.60	8.55	30	4,800
	4,000	2.60	1.78	10.2	37	6,300
	6,000	2.90	2.00	13.4	55	7,300
8,000	2.90	2.00	16.3	75	8,200	
10,000	2.90	2.00	19.3	90	9,400	
Battery recycling LIB	4,000	1.90	4.0	12	30	3,500

*) Heavy-duty range available on request

Please note: All data provided are only intended as an indication and may be different for specific projects.





A WORLD OF SEPARATION SOLUTIONS

ANDRITZ provides mechanical and thermal solid/liquid separation technologies, complemented by comprehensive services, automation, and digitalization solutions for the chemicals, environment, food and beverage, as well as mining and minerals industries. Our customized, innovative solutions focus on minimizing resource consumption and maximizing process efficiency, thus making a substantial contribution towards sustainable environmental protection. With over 150 years of experience and more than 2,700 separation specialists around the globe, we are a driving force in the evolution of separation solutions – enabling industries to meet tomorrow's demands responsibly. **ANDRITZ. FOR GROWTH THAT MATTERS.**

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