ANDRITZ Gouda drum dryer
Built on solid principles
Products have been dried industrially for more than a century. Since its early years, ANDRITZ Gouda has specialized in industrial processing lines.

The process
The ultimate drying drum

Drum drying is a continuous indirect drying method. Products are dried by spreading them in a thin and uniform layer onto the heated surface. Due to the kneading effect of the applicator system and to the scraped heat exchange surface, the dryer is unique for the drying of viscous, pasty, and sticky materials. Due to the short retention time of the product at high temperature, virtually no heat damage will occur. Contrary to the direct drying method, which uses hot air for evaporation, the drum dryer does not need any dust separation. The thermal efficiency is favorable, whilst no heat is wasted in the largest volumes of exhaust air. A very thin layer of the product to be dried is applied to the outside of a rotating cylinder (drum). This drum is heated on the inside by means of steam. When in contact with the heated surface, the liquid will evaporate from the thin layer very quickly. After an almost complete rotation of the drum, the remaining dried product is scraped off the drum surface in the form of a film or as a powder. A special composition of cast iron gives the drum a combination of favorable properties: very accurate shape retention even at high steam pressure and temperature, and excellent “scraping properties” for the scraping knife. Steam heating gives uniform temperature distribution over the drum surface, and this results in a consistent product quality. The steam condenses on the inside of the drying drum. The condensate is removed continuously from the drum to make the largest possible surface area available on the inside of the drum for condensation of the steam. The steam system is a closed system, which means that the product cannot come into contact with the steam or condensate.

Drum drying is an environmentally friendly drying method. There is hardly any dust emission, as only a relatively small amount of air is removed by suction. The maximum specified dust emission values can be obtained without complicated filter installations. Energy recovery and smell abatement are possible. The compact drum dryer leaves an interestingly small financial footprint.

Benefits
- Highest hygienic standard
- Low energy consumption
- High thermal efficiency
- A long, continuous life cycle

A relatively low investment in building and installation is required compared to other drying technologies. Drying can be an expensive part of the production process. With the ANDRITZ Gouda drum dryer, however, running costs can be significantly lower. Its high thermal efficiency translates to steam consumption of approx. 1.4 kg for each kilogram of water evaporated. Useful energy can even be recovered as it exits the system.
**Equipment**

The pure geometry of the drum creates the perfect heat exchange surface. Indeed the concepts of strength and simplicity are incorporated throughout the ANDRITZ Gouda design. And while cleaning industrial equipment might never be a joy, care in construction makes the necessary tasks as painless as possible.

The ultimate drying drum

Designing a pressure vessel to satisfy stringent production, quality, and safety parameters is not a role for the faint-hearted. In ANDRITZ Gouda’s experience, only cast iron of a special composition can ensure high quality drum drying. Its uniform hardness and homogenous structure equip the drum to withstand high temperatures and inner pressure with unflinching accuracy, whatever the prevailing operating conditions.

Also, chromium plating of the cast iron drum can be supplied for hygienic requirements or corrosive protection of the drum for certain applications. ANDRITZ Gouda drum cylinders are not just built for strength. They are machined both inside and out for smoothest action. A highly accurate curve and wall thickness ensure exceptionally consistent heat transfer.

An adaptable feed

Regular product distribution is the first essential within a controlled drying process. ANDRITZ Gouda can supply a wide range of fixed or transferring feed systems to suit particular product and viscosity types.

Recovery that’s pure and simple

The cast iron construction of the dryer’s scraper assembly guarantees uniform pressure over the full length of the drum, and further serves to eliminate vibration. Knife pressure can be controlled hydraulically. Dried product is recovered as film or powder into a special screw conveyor, complete with pre-flaking capability, enabling the output to be transported easily. A special adaptation of the recovery system is available for handling thermoplastic products.

Drive

ANDRITZ Gouda supplies a variable speed drive as part of the process control system. This drive can be provided with an explosion-proof motor and is built up furthermore using tested standard components from reputable manufacturers. The choice can be made in consultation with the customer.
ANDRITZ Gouda drum dryer
Visual impressions

- Special design drum dryer
- Drum dryer with vapor hood
- Double drum dryer
Building a reputation for quality means using highly specified materials and components. Special, completely closed alloy castings for optimal heat transfer, vapor hood tracing, special bearings, are all standard. ANDRITZ Gouda’s quality assurance includes certification by ASME, TÜV, European PED, and CE. Depending on the design, the product is applied continuously as a thin film at the bottom or on top of the main drum. As the drum rotates and is heated on the inside, the product dries on the outside of the drum surface. The brief exposure to a high temperature reduces the risk of damage to the product.

The construction of the knife holder guarantees even pressure over the entire length of the drum. The use of specific materials prevents vibrations as a result of scraping and guarantees uniform product removal. The pressure of the knife can be controlled simply and outside of the process area.

Various designs
Different operating principles

Precision-engineered for ultimate stability, ANDRITZ Gouda dryers are equipped for a long, uninterrupted life-cycle.
The double drum dryer

A double drum dryer is often used for products with lower viscosities. The product is fed into the sump between the two drums. The distance between the drums can be adjusted accurately to control the layer thickness on the drums. In addition, applicator rolls can be used. This machine can also be used as two single drum dryers with overhead applicator rolls.

Various designs

The single drum dryer

On the single drum dryer, the wet product is fed to the dryer by means of applicator rolls.

Depending on the number of applicator rolls used, the layer formed on the drying drum can be thicker or thinner. The special construction of this dryer makes it particularly suitable for processing pasty or pulpy products. This is due to the applicator system, which ensures perfect distribution of the product along the full length of the drum. In addition, the kneading effect of the rolls, prevent sticky products from forming lumps.

Drum dryer with applicator rolls
The applicator rolls make it easy to regulate product feed. In addition, they have a kneading effect, preventing lump formation in stickier materials. With perfect distribution along the length of the drum, the system is ideal for processing pasty or pulpy products.

Drum dryer with bottom dip roll
A version designed for specific applications and chemicals. In this machine, the roll sits underneath and dips into the product, picking up a liquid layer for transfer to the drum – similar to a printing press.

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

Double drum dryer with applicator rolls
The double drum dryer with applicator rolls is suitable for customers with more variables in their product range. This multi-functional setup offers the greatest versatility – combining the advantages of both the single and double drum dryer systems.
Vacuum drum dryer – batch type

Enables drying at low temperatures, thus avoiding damage to heat-sensitive product components. Freedom from atmospheric contamination and independence from climatic conditions, operating results are always uniform. Moreover, these dryers can be used for recovery of solvents by collecting the vapors forming during the drying process. Double vacuum dryers offer larger capacity and lower production costs. Two steam-heated drums revolve in a hermetically sealed casing under strong vacuum. Liquid is fed in between the rolls, dried, and scraped off before the drums have completed a single rotation.

Various designs
The vacuum drum dryer


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Food products may benefit especially
- Swift evaporation without risk of oxidation
- Enzymes and vitamins are preserved
- Coagulation of proteins is prevented
- Highly soluble end product

The vacuum dryers are very hygienic. There is no recirculation of material, no waste is produced, and the drum is accessible for thorough cleaning. Since operation is totally independent of climatic conditions, results are always the same.
Research and development
Realizing the future vision

Research and development has been the cornerstone of ANDRITZ Gouda’s success. The R&D activities are carried out in close co-operation with clients and focus on the feasibility of a desired process or product.

ANDRITZ Gouda is implementing future standards, today. Making better, cleaner, more complete dryers, with stainless steel parts made of the best grade. Designing systems with minimal energy exhaust and dust emission (no complicated filter installations required). And, of course, ensuring optimal hygiene throughout the process – machines that operate to HACCP/EHEDGE standards.

Energy-efficient, environmentally friendly
With the ANDRITZ Gouda drum dryer, running costs can be 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. Useful energy can even be recovered as it exits the system. Drum drying is environmentally friendly as well; there is hardly any dust emission, thus avoiding complicated filter installations and additional waste.

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

Innovation areas of the drum dryer are:
- Increasingly hygienic design
- Machine safety
- Maintenance aspects
- Product quality
- Energy savings/recovery
- Operator independence

The dryer’s process area is separated from its mechanical components, thus eliminating the risk of contamination.
ANDRITZ Gouda is implementing future standards today, ensuring optimal hygiene throughout the process.

Applications
Food industry

The use of ANDRITZ Gouda dryers is not limited to the mere evaporation of water or solvents from a given product. In the case of certain nutritious substances, for instance, there is also a ready-cooking effect in addition to drying and at which remarkable instant properties are obtained. Various world-famous instant foods are therefore 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 product components. Evaporation occurs within seconds, without risk of oxidization. Enzymes and vitamins are preserved, and the coagulation of proteins is prevented. And the final product – either in flake or powder form – is highly soluble, allowing rapid reconstitution to a liquid.

Applications
- Cereal-based baby food
- Milk
- Cereal-based drinks
- Yeast
- Pre-gelatinized starch
- Gelatin
- Potatoes
- Fruit

Advantages
- Short residence time
- Vacuum options
- Continuous process

Specialized drum dryers for products based on milk, starch or cereals
ANDRITZ Gouda not only produces a range of standardized machines, but also has wide experience in building special machines according to customers requirements. Turnkey solutions for various applications.

Although each production line must be specially designed, a modern processing line will include intake, weighing and mixing of raw materials, a drum drying section, a milling section, storage silos, and a section for composing and mixing the final formulation. Over the years, extensive knowledge has been gained on all kinds of production process possibilities and machines to obtain the final product characteristics.

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 product, year after year. The single drum dryer with a bottom dip roll is a version designed for specific applications and chemicals.

Since the drying characteristics of most products are not entirely predictable, we use pilot plant testing to select the most efficient machine model and size.

For more than 90 years of continuous operation, ANDRITZ Gouda’s pilot plant has tested and developed solutions for a huge variety of requirements. These results and the experience gathered are put to work for today’s customer requirements.

Applications
Food industry

Turnkey solutions for various applications

Applications
Chemical, pharmaceutical industry

ANDRITZ Gouda not only produces a range of standardized machines, but also has wide experience in building special machines according to customers requirements.

Applications
Animal-based glue
Pesticides
Sodium benzoate
Polymers
Pigments
Detergents
Enzymes
Proteins

Advantages
• Short residence time
• Vacuum options
• Continuous process
Determining new process technology viability and success

A unique feature and part of ANDRITZ Gouda’s R&D program is the pilot plant. The pilot plant is a valuable test center 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 Gouda offers an integrated approach for the setup of food processing lines, contributing to significant cost saving (for the customer) on the production process.

ANDRITZ Gouda has several pilot plants available to test new materials, generate design data, and provide representative product samples. The proven calculation model for scaling up to industrial size ensures successful application in real-life processing.

ANDRITZ Gouda pilot plant: For reliable upscaling

Soya sauce dried on a pilot machine
ANDRITZ Gouda drum dryer
Visual impressions
Worldwide service 24/7
No added value but an absolute must!

Delivering quality equipment and always being there when the customer needs you are ANDRITZ Gouda’s guiding principles.

Customer-orientated for over 100 years
ANDRITZ Gouda designs, builds, and maintains quality machines for the food, chemical, and waste processing industries. Characteristic of our technically orientated company is that we invest heavily in research and development in order to respond to the evolving needs of our customers. The development of machines is one thing. But if, like us, you sell far beyond the borders of your own country, your customers expect optimum service wherever they are and at all times.

Those that invest in this type of expensive equipment will expect constant use. Downtime means lost production. Delivering quality equipment and always being there when the customer needs you are ANDRITZ Gouda’s guiding principles. Thus, good service is not added value for us, it is a matter of course.

Responsible for our customers
For decades, ANDRITZ Gouda has been known to the world’s most important international companies as a very reliable partner. As with the production of our machinery, we strive to service our customers’ equipment to the highest attainable level. We contribute greatly to our customers’ production reliability, with a cost-effective maintenance budget for their machines.

ANDRITZ Gouda provides service and maintains customer contacts from its headquarters in the Netherlands and from offices in Germany, Asia (Singapore and Indonesia), and the USA. The service team of experienced and well-trained specialists is jointly responsible for installation, commissioning and operation of the machines and, of course, is available 24/7 – worldwide. Customers receive assistance with training of operating and maintenance personnel, repair, overhaul, upgrade, parts supply, and relocation of machinery.

Parts supply
The service department is perfectly equipped to supply spare parts. Many critical machine parts are kept in stock in the warehouses in the Netherlands and in the United States. ANDRITZ Gouda can supply parts, globally, at very short notice. Our goal is to minimize customers’ downtime and ensure their continuity of production.
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 dryer with 44 m². 

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

ANDRITZ Gouda has been implementing complete process solutions for the environmental, chemical, and food industries for over 100 years. As a machine manufacturer as well as process solutions expert, ANDRITZ Gouda is able to handle all of the stages involved in designing and building plants, including engineering, service, installation, and commissioning.

ANDRITZ Gouda, as part of the international ANDRITZ GROUP, has several pilot plants available to test new materials, generate design data, and provide representative product samples. The proven calculation model for scaling up to industrial size ensures successful application in full-scale processing.