

## NONWOVEN LET YOUR-INVESTMENT FLOW BACK WITH WETLAID

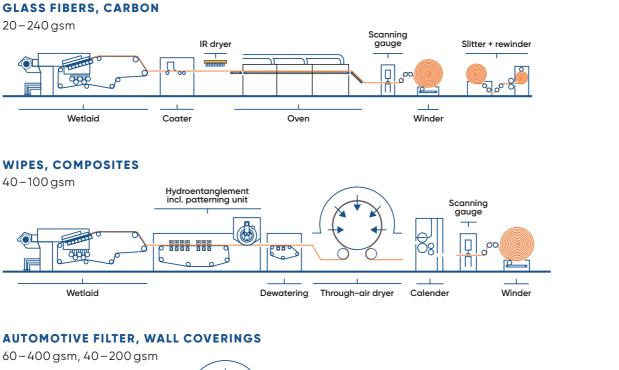
FOR YEARS TO COME

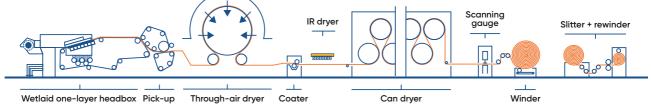


ENGINEERED SUCCESS

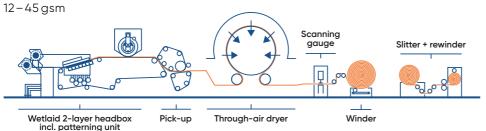
## Numerous line configurations

**Team up with ANDRITZ:** Benefit from extensive process know-how and years of experience in projects for the paper and nonwovens industries. Obtain comprehensive technology solutions from a single source for every challenge. You can apply neXline wetlaid technology flexibly in the automotive, aerospace, agriculture, construction, and medical/hygiene industries, as well as in the household sector.





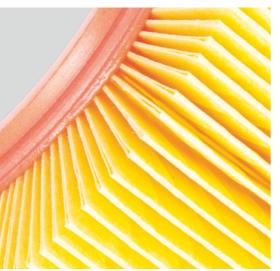












## VARIOUS APPLICATIONS Wetlaid can be used for a large

number of markets, such as:

- Automotive
- Aerospace
- Agriculture
- Construction
- Medical/hygiene industry
- Household













"The wetlaid development has allowed producers to use a wider variety of fibers, beyond just wood pulp, than in traditional paper-making, thus also allowing a wider range of properties and end uses. Wetlaid is mainly used for applications such as filtration/ separation, wall coverings, electronics, buildings, tea bags, and to produce dispersible material for the single-use wipe market."

EDANA (European Disposables And Nonwovens Association)

Wetlaid line configurations  $\rightarrow$ 

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## AUGMENTED REALITY CONTENT

To show videos, illustrations and picture galleries in a more direct and lively way, we have added augmented reality to several contents! Download our **ANDRITZ AR APP** from our website or from the AppStore/PlayStore!

SCAN THE MARKED PAGES AND EXPERIENCE THE ENHANCED CONTENT.





## Build your future in wetlaid

Newly developed, high-tech fibers and the rediscovery of natural fibers are continuously opening up new niche markets for wetlaid nonwovens in almost all areas of industry. The applications range from tea bags, coffee pads and filter materials to wallpapers, flushable wipes, glass fiber mats, protective hygiene wear, and security papers.

#### WOLFGANG SCHUMACHER

Head of Sales Wetlaid ANDRITZ Nonwoven "The wetlaid technology offers unique ways of using special fibers to make products for a wide variety of applications!"





## VARIOUS FIBERS OPEN UP NEW USE CASES

Wetlaid technology is well-suited to this diversity as it allows you to use any fiber type. Various other raw material types, such as glass or carbon fibers, and corresponding end uses underline how flexible the process is.

Moreover, the wetlaid technology targets the rising demand for eco-friendly nonwovens. Combining wetlaid and hydroentanglement enables you to produce fully biodegradable nonwovens without chemical additives or thermal bonding.

### YOUR PERFECT PROJECT PARTNERS

ANDRITZ delivers complete wetlaid processes to you from just one source. Our system supply services are cost-efficient, flexible, and reliable, and they cover the entire spectrum. You benefit from comprehensive process know-how, ensuring all components are in harmony. From stock preparation coating, we provide tailor-made solutions.

Achieve your project objectives in terms of costs, timing and quality: Our customer-focused project management reduces delivery, line start-up times and secures prompt ROI. Work with our tools to view complete plant engineering in 3D and handle plant documentation in a state-of-the-art DMS.

### OUR SERVICES ASSIST YOU WITH REGARD TO

- equipment
- processes
- control and instrumentation
- layout
- general, mechanical, hydraulic and pneumatic engineering, piping, and lubrication



## **Entire line supply**

**Components in tune:** As our customer, we provide you with a wide range of wetlaid line concepts. The neXline wetlaid example shown below has been designed especially for special filtration materials. Our line supervision shows you all data at a glance – an excellent production overview that offers you comprehensive monitoring and control.

### STOCK PREPARATION

The stock preparation and approach flow systems create a homogeneous fiber and water dispersion during transportation to the forming unit. This includes pulping, screening, cleaning, refining, thickening, deflaking, and fiber recovery.

#### FORMING UNIT

This is the core component of any wetlaid line. In this process step, fibers are laid on an inclined wire to create a web. A controlled fiber and water flow system provides even web formation.

#### CAN DRYER

This can dryer is used to ensure homogeneous moisture reduction by means of contact drying. The dryer capacity is tailored to suit the line speeds.

ANDRITE

#### PRESS SECTION

The initial mechanical dewatering step right after the web forming process reduces moisture content considerably. This leads to substantial reductions in energy consumption in all subsequent drying processes.





As the remaining moisture has to be discharged after the though-air drying process to allow the web to be well prepared for coating, the can dryer is essential.

#### THROUGH-AIR DRYER

The through-air drying process provides bulky, porous, and soft product properties. Independent wet and dry temperature zones can be adjusted individually to ensure an optimized drying curve.

#### IR DRYER

Contactless predrying with a double-side IR dryer ensures careful drying while preventing any accumulation of the coated material on the subsequent components in the process.

### COATING UNIT

This simultaneous double-side or only single-side coating unit enables the use of different coatings and coating weights. An add-on at the high-performance dosing station leverages performance.

### CALENDER

ANDRAL

The calender provides softening or embossing to customize the material.

#### CAN DRYER

This can dryer section completes the drying and curing procedure in its homogeneous drying process.

## **Test with the experts**

**Product potentials light up new paths:** Ongoing research and product development can open up a multitude of solutions for you to leverage the nonwovens market. Together with you, we seek the ideal solutions to achieve your goals.







#### **CREATE NEW PRODUCTS**

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Thanks to a highly flexible pilot line, you can try out many different fibers and options. You can test almost any potential fabric combination quickly, simply, and with cost efficiency and low fiber consumption. It is tailor-made to suit your very specific needs.

## CONTINUOUS PRODUCT DEVELOPMENT

You benefit from innovative, integrated process concepts from a single source. This is the result of the close-knit, internal development collaboration between the ANDRITZ technical centers in Graz (Austria), Krefeld (Germany), Montbonnot (France). The technical center in Graz is equipped for all fiber preparation and processing trials and tests.

The test center in Krefeld hosts a complete wetlaid/wetlace<sup>™</sup> pilot line. It is also supported by ANDRITZ Montbonnot, where our hydroentanglement test plant is located.

## WETLAID PILOT LINE IN KREFELD

The wetlaid pilot line in Krefeld is well-frequented by leading producers of fibers and roll goods. Here you can perform tests with:

- a pulper
- chests for two layers
- a distribution system
- a headbox
- an inclined wire section
- two hydro-entanglement injectors
- and a cylinder dryer, including a winder.

You can count on our team of competent process engineers, who will be pleased to assist you. All trials and results are kept strictly confidential.

### COOPERATION WITH THE SCIENTIFIC ELITE

Collaboration with associations, institutions, R&D centers, and universities is essential in order to stay ahead. This is why ANDRITZ teams up with research institutes and universities in the composites, fiber-reinforced plastics and filter media sectors all around the globe. And you can also take advantage of collaboration with these entities.

## YOUR BENEFITS

- Integrated laboratory to test nonwoven fabrics
- Highly flexible testing environment
- Cost efficiency thanks to tailor-made test solutions
- World-renowned expertise in high-tech fiber treatment
- Full support by the ANDRITZ expert team
- Complete documentation of all results with strict confidentiality



# **Monitoring tool**

**Control parameters and improve performance:** ANDRITZ has developed a monitoring system that ensures smooth operation and improves your process and plant profitability. It gives you constant control of your line parameters and creates the best configuration to enhance your production.

### INDUSTRIAL IOT FOR SMART PRODUCTION

Sensors on the machines record sensitive data for you and send it automatically to the monitoring system. It provides you with a summary of the data in comprehensive reports, helping you to improve the line's performance. Reports show you important information, such as CV deviations, MD/CD deviation, optical quality, humidity deviation, and much more.

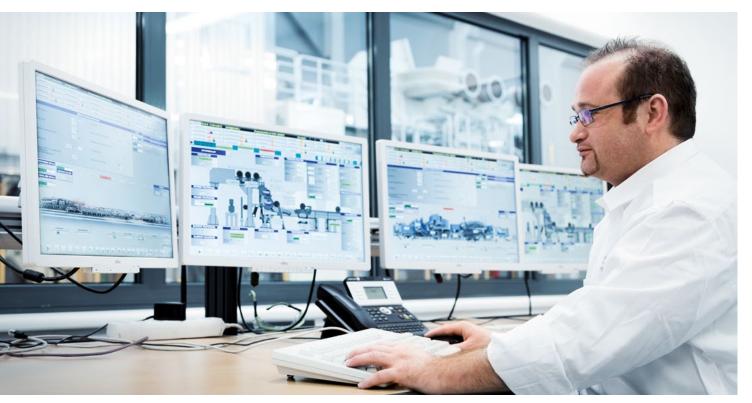
#### **CONSTANT IMPROVEMENT**

Improve your performance with monthly executive reports from ANDRITZ textile engineers. They give you recommendations on how to get more out of your equipment.

"Walking cameras" help you easily explain a situation or a problem to the ANDRITZ support team providing remote assistance. Thanks to this system, you receive preventive maintenance alerts that help to anticipate problems and reduce unplanned downtime.

#### YOUR BENEFITS

- All data at a glance
- Improved production
- Enhanced textile
   performance
- Less maintenance
- Designed to support neXmatrix tool



ANDRITZ monitoring system to manage the nonwoven wetlaid production line



## **Dedicated service**

We know how important uptime is for your production efficiency: That's why everything we do is designed to keep interruptions to a minimum for you. With remote maintenance and a highly responsive service team, we can react to any incidents in the shortest possible time.

#### **SPARE PARTS**

To ensure the longevity and performance of your equipment, we recommend using only original spare parts from ANDRITZ.

A sales team for spare parts is at your disposal at ANDRITZ to help you make the most suitable choice.

#### **UPGRADES AND RETROFITS**

ANDRITZ specialists are available to inspect your production lines and propose improvements to extend the product life of your equipment and improve your productivity.

### SKILLED TECHNICIANS AT YOUR DISPOSAL

With the goal of providing you with the most efficient and responsive service possible, ANDRITZ assigns a dedicated team of skilled technicians to you, along with automation and textile engineers.

### **ONLINE SUPPORT**

ANDRITZ is there for you at all times. You can always rely on a competent partner to explain problems related to textile, mechanical, or electrical/ electronic issues.



View our service contacts in our augmented reality app! FOR FURTHER INFORMATION SEE PAGE 5



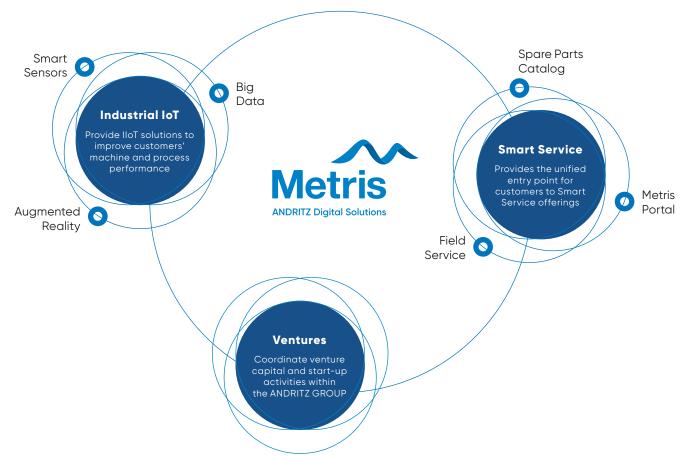
### YOUR BENEFITS

- Service centers around the globe
- Technical and electrical diagnosis by experts
- Complete stock of original parts
- Assistance with installation, operation, maintenance, and training
- Improve your production
   operations
- Enhance the performance of your equipment



## Metris: ANDRITZ Digital Solutions

**Digitalization is changing the nonwoven world:** With digitalization, Industrial Internet of Things (IIoT) and Smart Service, expectations for greater line efficiency and increased profitability are rising. This can be gained by networking of machines and applying such technologies as Smart Sensors, Big Data Analytics, and visualization using Augmented Reality. Metris OPP (Optimization of Process Performance) as one of the core products of the Metris portfolio can provide the whole range according to individual needs.



#### WHAT IS METRIS?

With the Metris brand's digital solutions, you are preparing for the growing digital challenges in the industrial environment. Metris products are the very latest state of the art – they can be customized to suit your individual requirements. They make you achieve the best possible productivity and efficiency for your nonwovens production.

#### WHAT DOES METRIS OPP DO?

The intelligent Metris OPP platform analyzes available line data, compares it with data already gathered, assesses the data, and provides you with valuable output. But Metris OPP is not just a platform – it offers ANDRITZ service contracts for both on-site and remote assistance services by specialists.





## YOUR BENEFITS

- Full use of equipment and no need to install new hardware
- Continuous measurement of savings
- Ongoing R & D to provide the latest state-of-the-art technology
- Field model proven in many different countries
- Big data analysis with tried-and-tested models for deviation analysis
- Providing information locally with augmented reality
- Extensive solution and process engineering knowledge
- Cybersecurity solution to safeguard data on the network



View video in our App! for further information see page 5



#### **SMART SENSORS**

ANDRITZ uses micro and wireless sensors for Metris solutions. You can use these sensors to collect even more detailed machine and plant data that are taken from pre-defined areas and are relevant in optimizing operations.



#### **BIG DATA ANALYSES**

To provide you with a rapid overview of the plant operating status, the data is analyzed automatically in real time. Necessary control measures can be initiated based on the knowledge of possible effects in order to avoid plant shutdowns, for example, or reduce the use of consumables.



#### AUGMENTED REALITY

Augmented reality can make information visible at the machine or plant and display it very easily on mobile devices such as a tablet PC or smartglasses. Technology enables you to operate the machine and system more easily and more efficiently.



# **ANDRITZ wetlaid process**

**Combine and interact:** Every component for stock preparation, from the fan pump to the forming wires and forming unit, plays an essential role in your wetlaid line. Combined with ANDRITZ project management knowhow, all components become a shining example of high-performance wetlaid technology.



#### **STOCK PREPARATION**

You benefit from the support of a leading supplier of integrated stock preparation and approach flow systems for the production of all wetlaid grades. ANDRITZ's innovative machine concepts are your guarantee for top-notch efficiency at low energy consumption with a minimum impact on the environment. From pulping to screening, cleaning, refining, deflaking, thickening and fiber recovery – the system encompasses all your process steps.

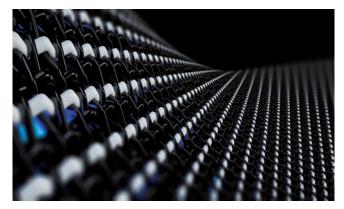
#### FAN PUMP

ANDRITZ is one of the major suppliers of pumps used in paper and wetlaid nonwovens production. The fan pump charges the dispersion to the distribution system. Double-suction pumps with low pulsation (two-pass pumps) are used as fan pumps. Capacities of up to approx. 7,000 kW power and approx. 20,000 m<sup>3</sup>/h are possible.

#### FORMING WIRES

You can trust in ANDRITZ's long-standing expertise in the forming wire sector. They provide the right choice for any application with around 150 types of different wire designs for a multitude of wetlaid applications. Choosing the optimum design in terms of fiber support, drainage index, permeability, and cleaning ability is crucial to ensuring smooth performance during production.











## neXformer eXcelle forming unit

**The heart of wetlaid technology:** The neXformer is your core component for all wetlaid lines. Here, fibers are formed into fabric on an inclined wire. Whether the one-layer or multi-layer neXformer is best for you, we provide the right configuration tailored to your needs.

#### WET FORMING

At the heart of a wetlaid production line, the neXformer is crucial to the process. For wetlaid nonwovens with controlled porosity, the inclined formation path is essential to enable fibers to settle consecutively. Fibers of up to 38 mm in length (in some cases even longer) can be used.

Improve your performance with the in-depth knowledge of wetlaying processes from ANDRITZ and benefit from years of expertise in the paper industry that guarantee the most competent solution for your business.

#### **MULTI-LAYER HEADBOX**

The multi-layer headbox is available to you as a special option for two or more layers of dispersion – this is to your advantage because fibers from different materials or blends are layered without any need for auxiliaries.

#### **HOMOGENEOUS PRODUCTS**

In low-density dispersion, water is pumped into the headbox through a special connecting pipe in the distribution system. The fibers settle on the wire under uniform pressure and optimal flow conditions to disperse and form a web. You obtain a homogeneous product with controlled fiber formation and porosity.

#### **YOUR BENEFITS**

- State-of-the-art technology
- European manufacture
- End-product development
- Audit and performance consultation
- Customized configurations
- Rebuilds and upgrades for quality and capacity increase

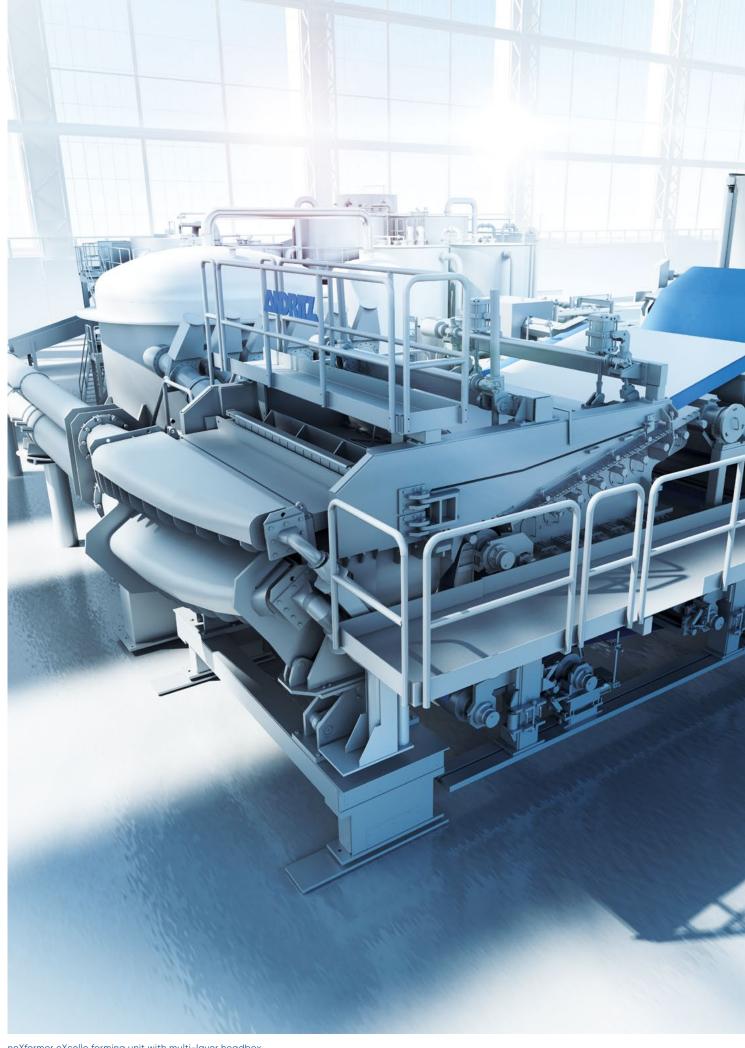


#### FEATURES

- Capacity: 10,000-100,000 t/a
- Line width: 2,000-5,500 mm
- Line speed: 200-500 m/min
- Basis weight: 12-400 g/m
- Integrated wetlaid formation with distribution, headbox, inclined wire section, and dewatering box, fully customizable to your demands







neXformer eXcelle forming unit with multi-layer headbox

## neXline wetlace™ production line

**Set new standards for flushable wipes:** The original ANDRITZ wetlace<sup>™</sup> combines wet forming and hydroentanglement. This tried-and-tested process has proven ideal for producing flushable wipes from 100% natural and/or renewable raw materials without chemical binders.

#### MARKET SITUATION

Today, disposable nonwovens have to be sustainable, environmentally friendly and comfortable, as well as cost-effective. For Moist Toilette Tissue (MTT) producers, flushability is crucial.

ANDRITZ wetlace<sup>™</sup> nonwoven fabrics have passed all EDANA/ INDA flushability tests and fulfill the strict specified requirements.

#### THE CHALLENGE

Your material must have excellent wet and dry tensile strength during production to withstand various process stages. Moistened and packed, your end-user expectations also have to be met: adequate strength while in use – quick dispersal once flushed.

#### THE SOLUTION

The innovative ANDRITZ wetlace<sup>™</sup> technology provides you with excellent web uniformity. It blends the web on the inclined wire and bonds it mechanically in the hydroentanglement unit.

This innovative process gives you superior web uniformity and product quality. The material strength is achieved through mechanical web bonding via hydroentanglement, which entangles the fibers without the need for chemical binders or thermoplastic fibers.

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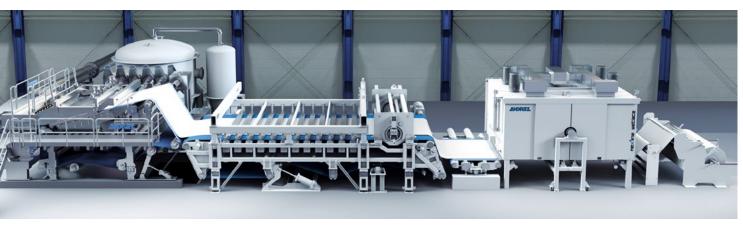
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### YOUR BENEFITS

- Development technology: Made in Germany
- Each line is fully tailored to the customer's demands
- Rebuilds and upgrades for quality and capacity
- Our experts accompany you from consultation, planning and commissioning through the entire product life cycle

#### **FEATURES**

- Capacity: up to 30,000 t/a
- Line width: from 1.5 to 4 meters
- Line speed: up to 350 m/min
  Future-oriented, high-end technology for more sustainability, provided entirely from a single source



neXline wetlace™ production line for wipes



**FLORIAN DIEDERICH** 

Head of Application Engineering Wetlaid ANDRITZ Nonwoven "As they are fully biodegradable in compliance with environmental protection needs, wetlace<sup>™</sup>-based hygiene products are an unbeatable alternative to conventional spunlace products."





## neXline wetlaid production line for glass fiber

**Discover one of the most sophisticated solutions available on the market:** The ANDRITZ wetlaid multi-talent for production of your glass fiber-based end products.

Nonwoven end products based on glass fibers have a huge market and can be found almost everywhere – in ceiling tiles, cushion vinyl flooring, insulation, wallpapers, and surfaces, geotextiles, batteries, and of course roofing materials, as well as in many other applications.

Glass fiber as a basic component is an excellent composite material and offers numerous advantages that give the resulting products unique properties. These nonwovens are known for excellent thermal insulation, high tensile strength and extreme moisture repellency, for example. The manufacture of products based on glass fibers requires particularly gentle treatment in stock preparation and the laying process. Together with other important aspects, these are key to producing glass fiber material of excellent quality.

ANDRITZ provides you with concept and engineering know-how for a complete glass fiber line as a solution. Your production can take advantage of years of development competence in the wetlaid sector and very special expertise in the processing of glass fibers.

#### **YOUR BENEFITS**

- State-of-the-art technology for glass fiber-based production
- Development technology: Made in Germany
- Fully customized configurations
- Rebuilds and upgrades for quality and capacity
- From concept and engineering to start and service, our experts are close to you
- Full lifecycle service and support



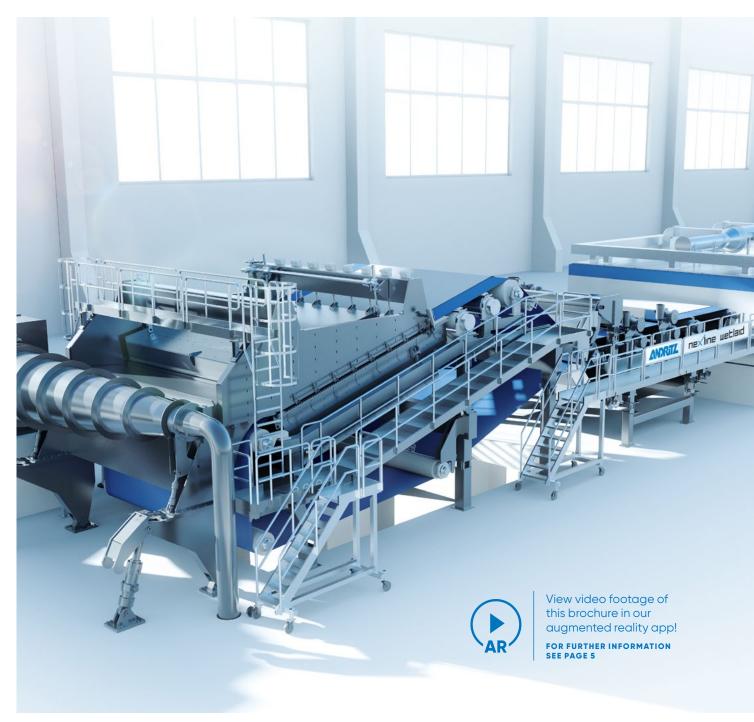
#### FEATURES

- Capacity: up to 100,000 t/a
- Line speed: up to 500 m/min (roofing materials: up to 500 m/min)
- Width: 1.5 to 5.5 meters
- From concept and engineering to realization and lifecyle-long service, a sophisticated solution from a single source



LEO BOS

Business Development Manager Wetlaid ANDRITZ Nonwoven "Glass fiber mats based on wetlaid production are an extremely costeffective option for a variety of end products in the fields of roofing, geotextiles, wallcoverings, carpeting, and much more."



neXline wetlaid production line for glass fibers



## neXformer aXcess forming unit

**Modular design, maximum versatility:** The neXline wetlaid aXcess is designed for your low to medium capacity production needs, for new as well as existing lines. The compact line is your ideal entrance to the growing wetlaid market, with a variety of final applications and options. With its operator-friendly configuration and versatile design, it enables you to produce efficiently at affordable investment costs.

#### **VERSATILE CONCEPT**

You can apply neXline wetlaid aXcess very effectively in the automotive, aerospace, agriculture, construction, medical, and hygiene industries, as well as the household sector. You have maximum flexibility in your process because many types of raw material, such as wood pulp, viscose, and glass or carbon fibers, can be used.

## COMPACT DESIGN OF FORMING UNIT (PATENT APPLICATION FILED)

Take advantage of the compact and modular layout of the neXformer aXcess. It fits perfectly into transport containers, making your shipment easy and fast. All parts come preassembled and tested before delivery. You save time with operator-friendly, on-site assembly that also minimizes your risks. There are no special building requirements (e.g. cellar), and the overall concept is quite space-saving.

#### **KEY TO THE WETLAID MARKET**

Open the door to the multifaceted wetlaid market with the neXline wetlaid aXcess. The compact design is suitable for low to medium capacity production and is very operator-friendly. This makes your entry to the growing wetlaid market easier than you could imagine.

#### **YOUR BENEFITS**

- Modular and compact design, small footprint, easy access for maintenance
- Lower market entry barrier
  - Fast change from production of one product to another
- Operator-friendly handling of machinery and process
- Flexible concept for different applications
- Affordable investment costs



neXformer aXcess forming unit in transport container

#### FEATURES

- Capacity: 2,000-6,000 t/a
- Line width: 1,500 mm
- Line speed: up to 150 m/min
- Basis weight: up to 120 gsm
- Fibers suitable for the process: renewable fibers, man-made fibers, binding fibers, high-tech fibers, carbon fibers, glass and micro glass fibers, aramid, metallic fibers, and recycled fibers



neXformer aXcess forming unit



# **Spot-on drying**

**Exactly the right drying to suit your process needs:** Together with selected cooperation partners, ANDRITZ supplies state-of-the-art drying technologies to meet the highest performance levels for wetlaid nonwovens lines. The different dryers excel in achieving high nonwovens product quality with the proper drying process.

Depending on your final product, fiber blend and process parameters, ANDRITZ and its cooperation partners provide a number of different dryer types, like throughair dryers, can dryers and belt dryers to perfectly meet your process and product requirements.

#### neXecodry SYSTEM

Nonwoven producers are facing challenges over and above energy and quality issues. The neXecodry dewatering and drying technology contributes to a plant's ability to reduce its carbon footprint by reducing energy consumption. The neXecodry drying technology was designed by ANDRITZ to make significant reductions in the energy consumption of existing and new production lines. Perfect conditions for premium quality nonwovens in terms of bulk and softness are ensured.

#### YOUR BENEFITS

- Optimized drying curve
- Homogeneous moisture reduction
- Operator-friendly design
- Extremely durable
- Roll-in/roll-out design
- Reduced carbon footprint with technology

#### THROUGH-AIR DRYER

The ANDRITZ through-air dryer neXdry features high evaporation capacity and low power consumption and ensures bulky, porous, and soft product properties. Independent wet and dry temperature zones can be individually adjusted to optimize the drying curve. This dryer is designed and manufactured by ANDRITZ.



Through-air dryer



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### CAN DRYER

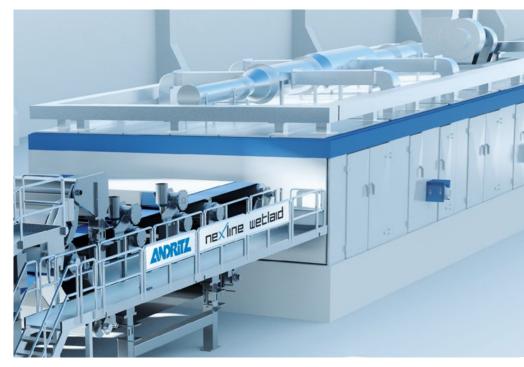
The can dryer ensures homogeneous moisture reduction via contact drying. Its capacity is aligned to process speeds. \*



#### **BELT DRYER**

This dryer is specially equipped to suit even glass and carbon fibers. The uniform drying properties provide ideal drying conditions, while maintaining the necessary moisture levels. \*

\* This dryer is delivered by a selected cooperation partner and integrated into the process by ANDRITZ.



Belt dryer



## **Resource management**

**Save resources, save money:** Water and fiber treatment are critical tasks that must be resolved. The right water recycling and recirculating solutions are essential if you want to reduce your energy costs.

#### WATER MANAGEMENT

ANDRITZ water filtration systems help you comply with the regulations on water recycling while minimizing the amount of waste water produced. The entire water recirculation solution targets less fresh water consumption using only a limited amount of chemicals.

#### FIBER MANAGEMENT

Whether renewable, man-made, binding or other fibers, you can use them all in the wetlaid process. You need professional fiber management with this great variety and large amount. Fibers can account for a substantial part of your production costs. The ANDRITZ edge trim recycling solution makes a positive impact on your operating margins by recovering waste. Focussing on raw material savings and waste recovery adds up to a significant return on your investment.

#### **ENERGY SAVING**

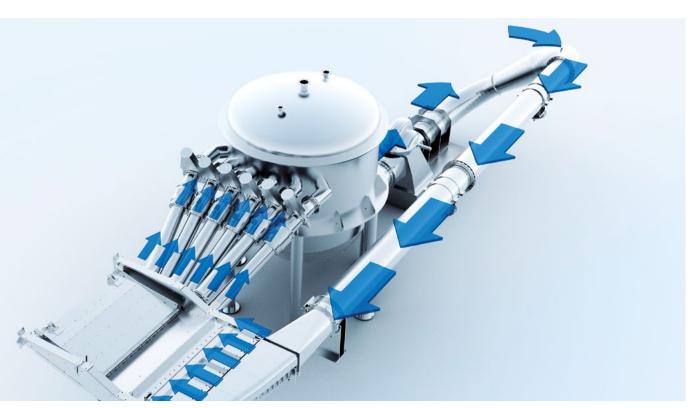
Make remarkable reductions in the energy consumption of your wetlace<sup>™</sup> production lines by combining dewatering and drying. Vacuum extraction together with dryer/exhaust heat circulation and recovery are key elements here. Processes requiring far less energy translate into cost efficiency for you.

### YOUR BENEFITS

- Short changeover times
- Simple cleaning process
- Efficient resource savings
- Optimized energy consumption



View video footage of this brochure in our augmented reality app! FOR FURTHER INFORMATION SEE PAGE 5



Water cycle within the wetlaid process

### POSSIBLE FIBERS FOR THE WETLAID PROCESS

Fibers	Application
Renewable fibers	e.g. pulp, flax, jute, coconut, cotton linters, abaca
Man-made fibers	e.g. viscose, PES, PE, PP, polyacrylic, nylon
Binding fibers	e.g. viscose, PES, PE, PP, polyacrylic, nylon
Other wetlaid fibers	high-tech fibers, glass and micro glass fibers, carbon fibers, aramid, metallic fibers, recycled fibers







Jute



Glass fiber



PES







Coconut





Pulp fibers





## GET THE MOST OUT OF YOUR INVESTMENT

At ANDRITZ Nonwoven, we know that your business depends on satisfied customers and efficient processes. That's why we support you in every aspect of your nonwoven production. Take advantage of technology that lets you produce consistent quality for decades to come. Profit from the highly efficient use of energy and raw materials that our production provides. You can rely on our responsive service teams who will protect your investment and optimize your processes. Experience how innovative approaches and digital services give you more control than ever before. With ANDRITZ, the leading supplier for the nonwovens market, you get the most out of your investment.

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