

Nonwoven calendering

Spot-on solutions tailored to your needs

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1949

R&D Center for textile machinery in Krefeld, Germany

1953

Company established by Eduard Küsters

1956

First Küsters patent: Swimming Roll

1961

First nonwoven calender sold

1974

Opening of ANDRITZ Nonwoven roll service center in Spartanburg, USA

2004

First installation of a neXcal twin

2005

First installation of a neXcal compact

2005

neXcal twin: winner of INDEX '05 award

2006

Acquisition by ANDRITZ GROUP: ANDRITZ Küsters

2010

Acquisition of ANDRITZ Perfojet including spunjet business

2011

Acquisition of ANDRITZ Asselin-Thibeau

2011

First installation of a neXline finish

2012

ANDRITZ Nonwoven roll service center in Wuxi, China

2015

Development of neXcal quadriga

2016

First installation of a neXcal twin aXcess

Our experience drives innovation, leaving its footprint on nonwovens technologies

Be it hygiene or medical, automotive or building, household or technical – nonwovens applications are manifold. Their outstanding properties require excellent engineering in an increasingly changing and growing market. This calls for a reliable partner like us, with spot-on solutions perfectly suited to your specific needs and with a passion for nonwovens technologies.

Experience combined with expertise

We are a leading supplier with more than 60 years of experience to fall back on, so you can rely on long-standing expertise and comprehensive project management – prompt and top-class. With more than 600 nonwovens calenders in operation worldwide, and installations in all high-end nonwovens lines, ANDRITZ stands for top performance, reliability, flexibility, and proven technologies. Whether it is thermo-bonding, embossing, compacting, lamination or perforation, we provide spot-on solutions to suit your needs. With more than 750 innovations with patents granted or pending worldwide, you have the advantage of innovative processes and depth of engineering. Comprehensive project management with one single contact supports every need, from the project phase right through to the warranty period.

We provide. You gain.

Our product portfolio offers complete system solutions, single units, rebuilds, automation systems, and comprehensive life-cycle services. We have the precise calender technology for your product – designed to meet your needs. Our calenders can also upgrade any existing line. Together we can design and innovate technologies to leverage any end use in the nonwovens market. Our state-of-the-art technical center encompasses the widest range of nonwovens calenders and testing opportunities on the market. Gain from our comprehensive know-how and long-standing experience.

Core competences

Drawing on our S-Roll core competence, all rolls are manufactured and mechanically tested at our facility in Krefeld, Germany. Roll technology efficiency is crucial to the success of the final product. We ensure top performance and ultimate flexibility.

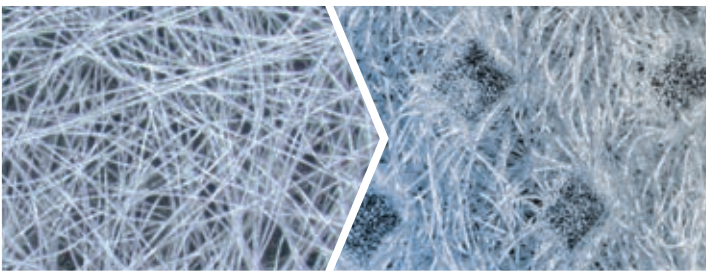
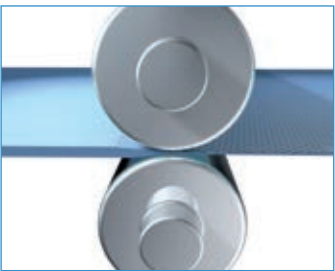
Wide spectrum of possibilities

The perfect solution to suit your needs

Whether your technology is spunlaid, drylaid, airlaid, or wetlaid, we provide the perfect solution to suit your special needs and final product demands. Benefit from our unlimited portfolio and our broad know-how for thermobonding, embossing, perforation, compacting, and lamination.

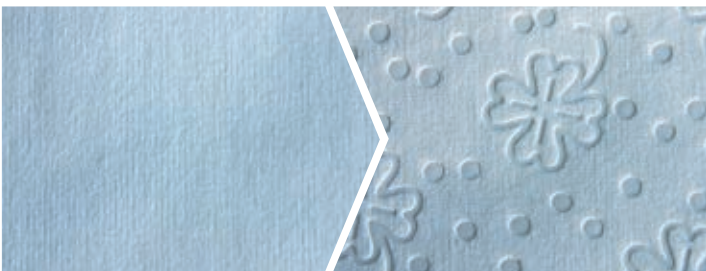
Thermobonding

- Partial bonding
- Full bonding



Embossing and perforation

- Flat embossing
- Relief embossing
- Pattern repeat embossing
- Friction perforation



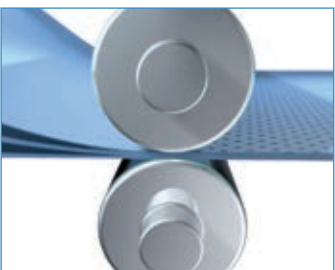
Compaction

- Compaction
- Calibration



Lamination

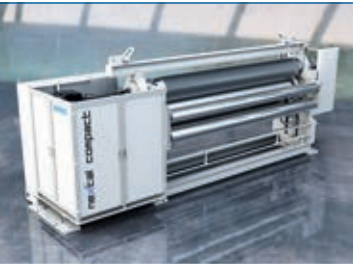
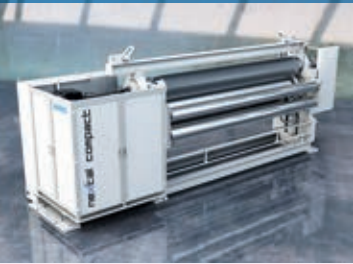

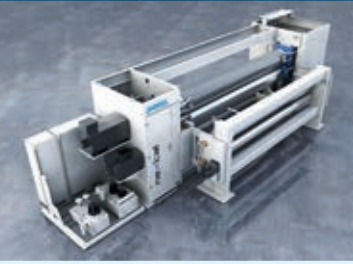


- Partial lamination
- Full lamination



Our nonwoven calender portfolio

At a glance

Depending on your final product and its parameters, like strength, softness, or air permeability, our nonwoven calender portfolio ranges from low and medium capacities (aXcess range) to high capacities (eXcelle range), precisely designed to meet your needs.

<div>Low capacity</div> <div>up to 9,000 t/a</div> <div>Line speed Working width Technologies End uses</div> <div>up to 400 m/min up to 3,800 mm Spunlaid, drylaid, wetlaid Medical, hygiene, roofing, geotextile, filter, etc.</div>	<div></div> <div>▲ neXcal compact 400</div>
<div>Medium capacity</div> <div>9,000 -12,000 t/a</div> <div>Line speed Working width Technologies End uses</div> <div>up to 600 m/min up to 3,800 mm Spunlaid, drylaid, wetlaid Medical, hygiene, roofing, geotextile, filter, etc.</div>	<div><div><div>▲ neXcal compact 600</div></div><div><div>▲ neXcal twin aXcess</div></div></div>
<div>High capacity</div> <div>12,000 -24,000 t/a</div> <div>Line speed Working width Technologies End uses</div> <div>up to 1,250 m/min up to 5,800 mm Spunlaid, drylaid, wetlaid Hygiene, medical, filter, etc.</div>	<div><div><div>▲ neXcal</div></div><div><div>▲ neXcal twin</div></div><div><div>▲ neXcal quadriga</div></div></div>

The key to the nonwovens market

ANDRITZ neXcal compact

This all-round nonwovens calender opens the door to the nonwovens market and meets the demands of low- and medium-capacity production in a capacity range up to 12,000 t/a. Enter the nonwovens market with a variety of final applications and possibilities.

Our space saving neXcal compact calender is your key to entering the nonwovens market. Whether your need is for spunlaid, drylaid, wetlaid, or technical applications with production speeds of up to 600 m/min, the neXcal compact offers the precise solution for low and medium capacities and is fitted with our proven Hot S-Roll technology and integrated cooling rolls to ensure best quality.

Plug and play

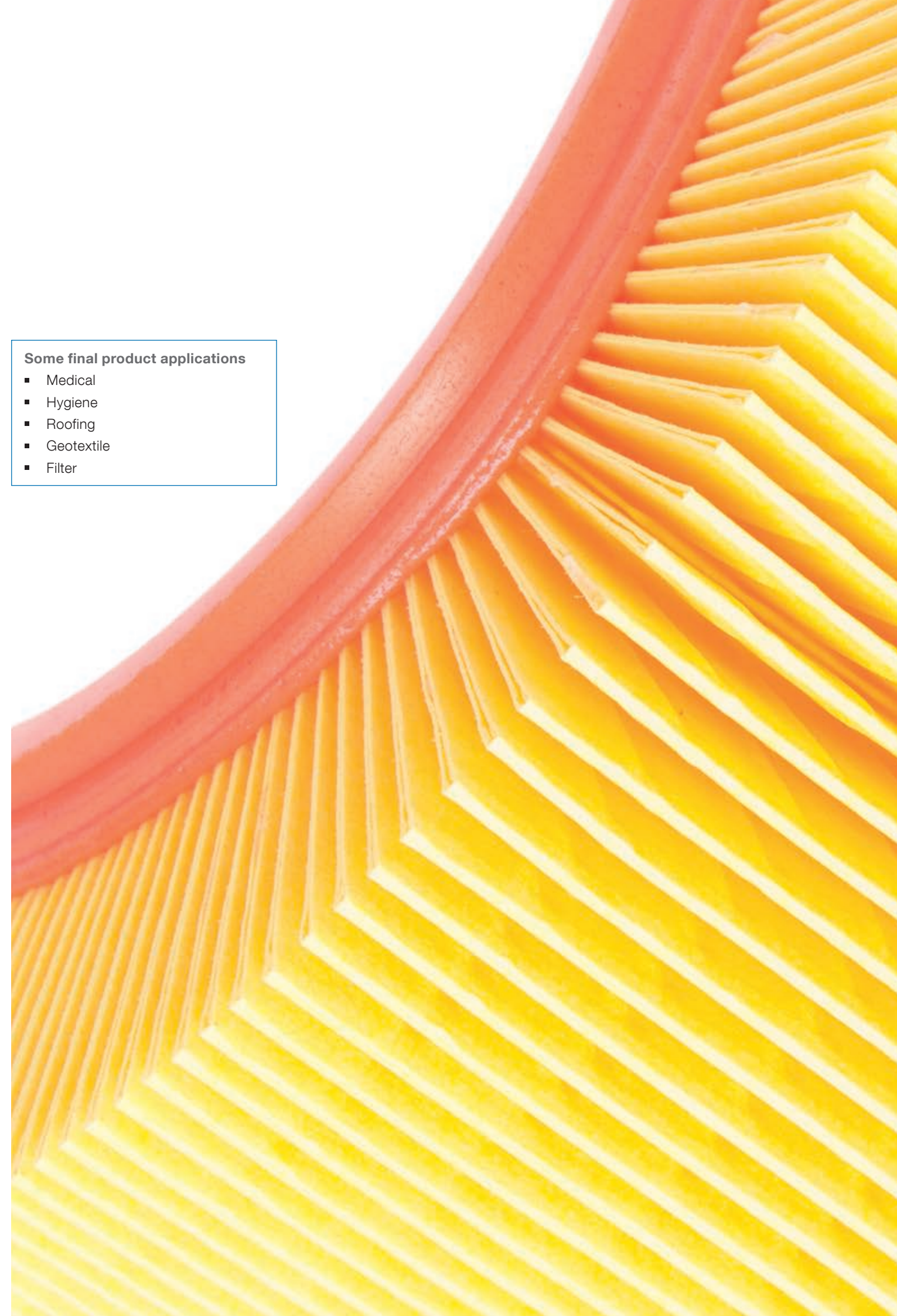
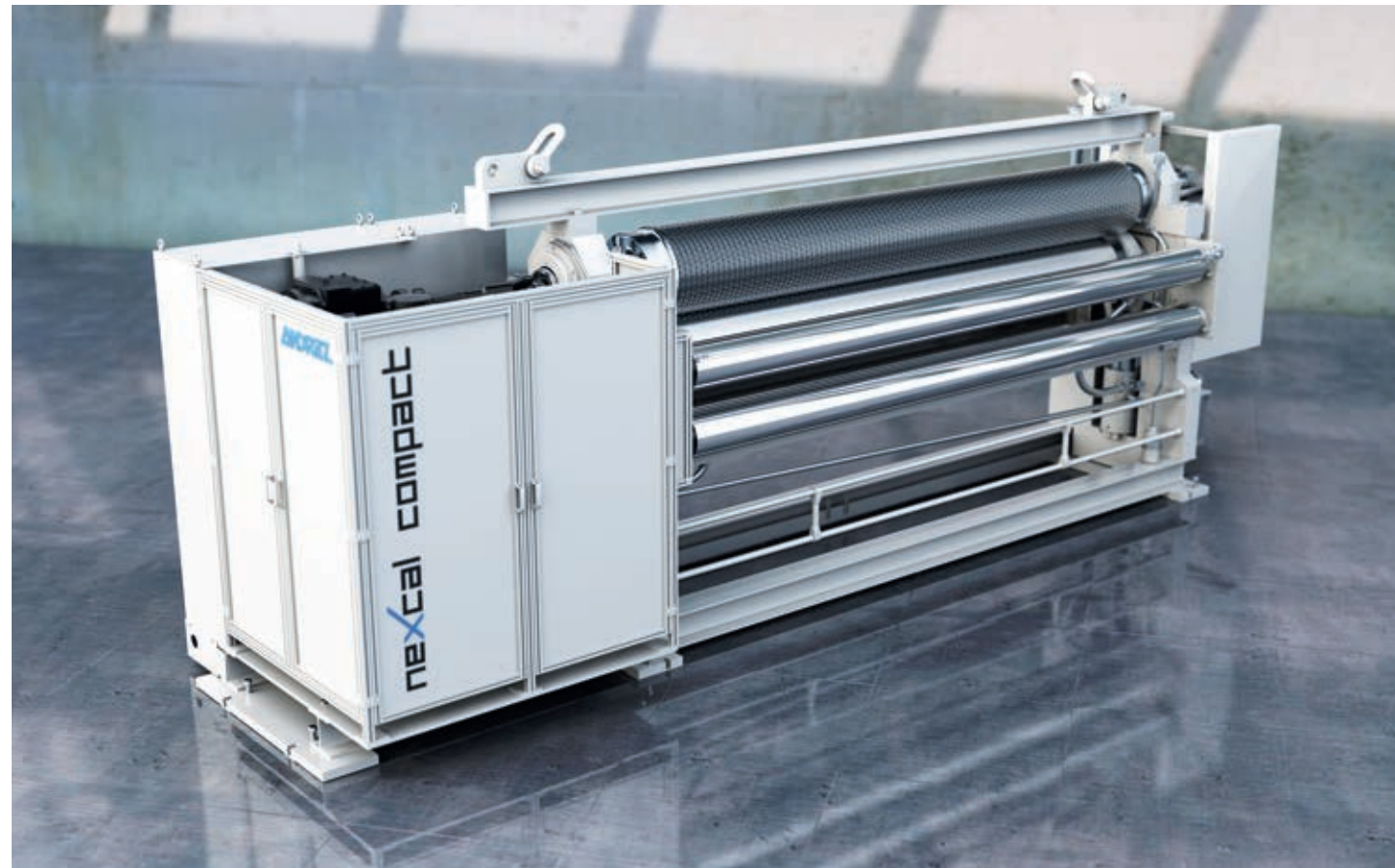
Thanks to its compact design, the neXcal compact takes up very little space. Delivered to your factory floor without any need for additional assembly, it is ready to be commissioned almost immediately (plug and play).

Design features

- Two types of neXcal compact:
 - Speed range of 400 m/min for low capacities
 - Speed range of 600 m/min for medium capacities
- Line force adjustable (during production) up to 150 N/mm over the entire web width
- Standard roll widths up to 3,800 mm (larger widths on request)
- Easy disassembling of upper roll
- Plug and play

Some final product applications

- Medical
- Hygiene
- Roofing
- Geotextile
- Filter



The specialist for top flexibility in the medium-capacity range

ANDRITZ neXcal twin aXcess

The neXcal twin aXcess three-roll calender is developed to open new horizons in terms of flexibility in the medium-capacity range up to 12,000 t/a. Tailored exactly to suit your target market.

This three-roll calender is specially designed for high flexibility in medium-capacity nonwovens market. One counter-roll in production position and one in stand-by position allow quick and easy product and roll changes by pre-heating or cooling down the roll while still in stand-by position. Its compact design takes up very little space and allows easy access to all components. The complete unit is delivered to your factory floor without requiring any additional assembly work there.

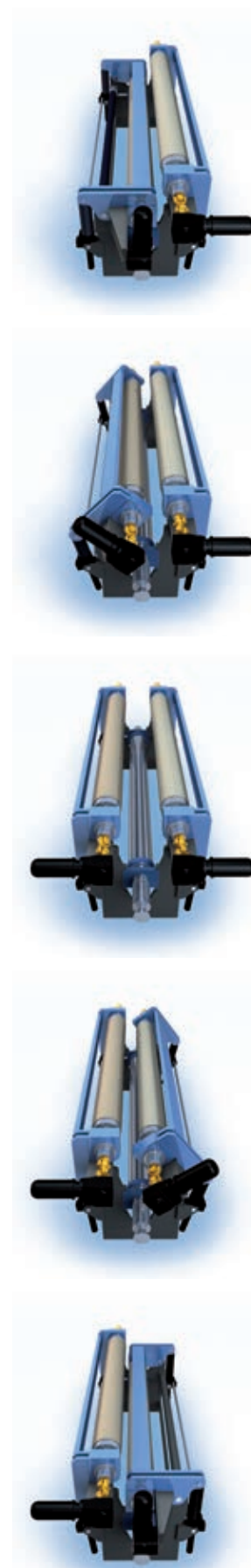
Thanks to the constant height of the web infeed to the machine, there is no need to adjust the conveyor belt, and engraving on the same web side is ensured. Benefit from maximum flexibility in the nonwovens market.

Design features

- Three-roll arrangement with one roll in production and one roll in stand-by position
- Speed range of 600 m/min for medium capacities
- Line force adjustable (during production) up to 110 N/mm over the entire web width
- Standard roll widths up to 3,800 mm (larger widths on request)
- Plug and play

Some final product applications

- Medical
- Hygiene
- Roofing
- Geotextile
- Filter



The benchmark for high-capacity spunbond production

ANDRITZ neXcal

The right solution for the demands of high-capacity nonwovens production up to 24,000 t/a with one engraving design in operation. Whether the applications are for hygiene, medical, or filtration, this calender is the right choice, guaranteeing the best result with just two rolls.

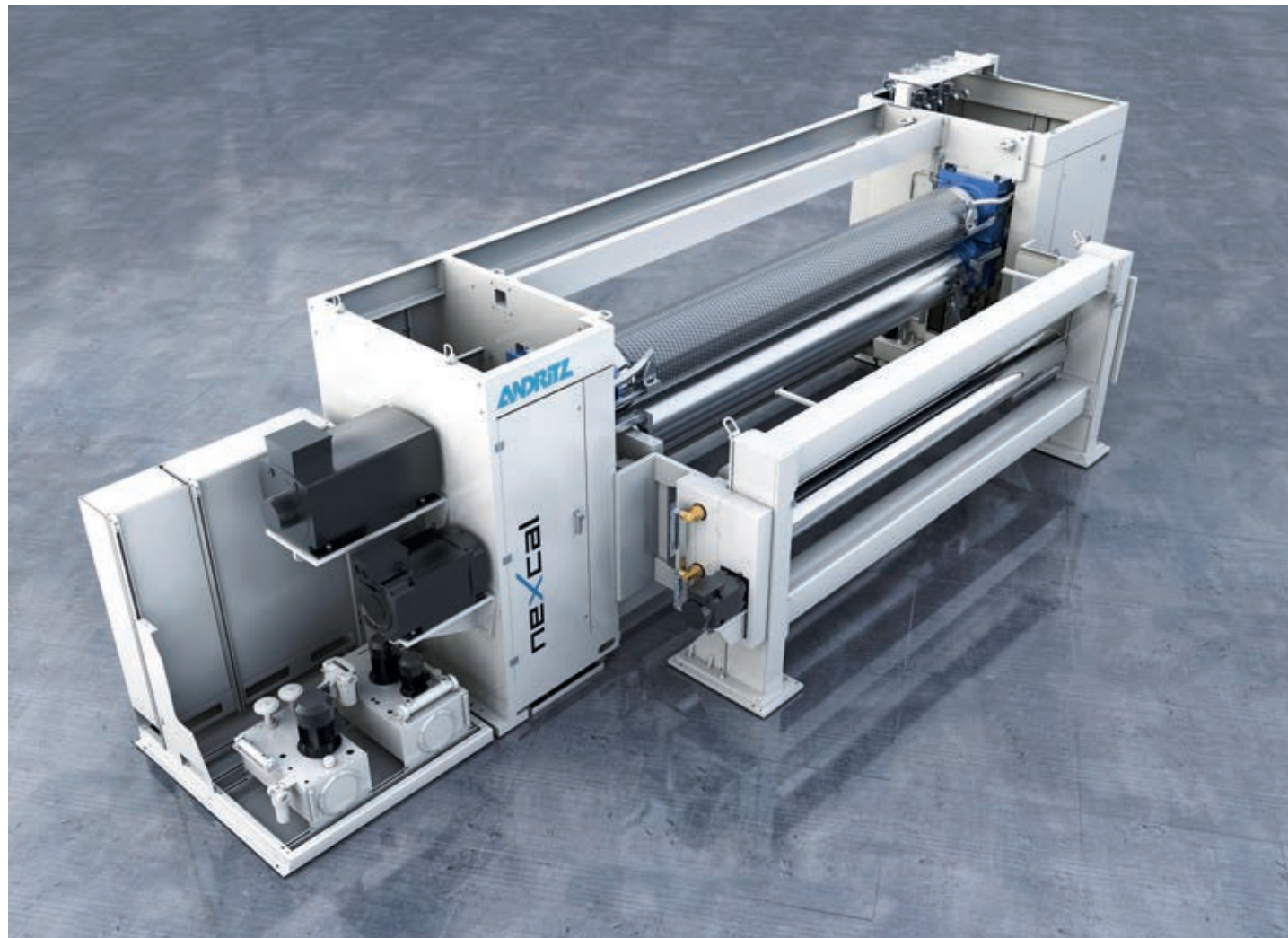
With a standard roll width of up to 5,800 mm and a speed up to 1,250 m/min, the neXcal two-roll calender allows you to enter the high-capacity spunbond market with different opportunities for multiple uses. One engraving design allows continuous production of a high volume of nonwoven fabrics. The open machine design offers easy access to the various components, hazard zones, and supply units.

High-speed production

With our expertise in high-speed production for the paper industry, we adapted this unit to produce up to 1,250 m/min of state-of-the-art nonwovens. Dust protection for all bearings and a separate cooling roll unit ensure a smooth process.

Design features

- Speed range of up to 1,250 m/min for PP, and up to 300 m/min for PET
- Line force adjustable (during production) up to 150 N/mm over the entire web width
- Standard roll widths up to 5,800 mm (larger widths on request)
- neXtrend monitoring system



Some final product applications

- Hygiene
- Medical
- Filter

The expert with utmost flexibility in nonwovens production

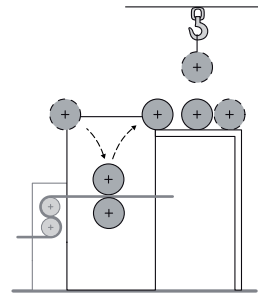
ANDRITZ neXcal twin

What are the demands of a modern nonwovens production plant? High production capacity, fast reaction, utmost flexibility, and excellent efficiency, to name but a few. The three-roll calender neXcal twin is the response to these demands. Our roll arrangement offers the benefit of fast and easy roll change.

Take advantage of a fast and easy product and roll change to increase your production time. Pre-heat the counter-roll while it is still in the stand-by position. Switch rolls quickly into production position with individual drive and supply units on each counter-roll. Cool the roll down while in stand-by position, ensuring a smooth production process. Thanks to the fixed height of the web infeed to the machine, there is no need to adjust the conveyor belt, and engraving on the same web side is ensured.

Upgrade your neXcal twin

Store your rolls with our roll stand next to your production process. This allows smooth roll changing during production and keeps the rolls in a tidy arrangement.

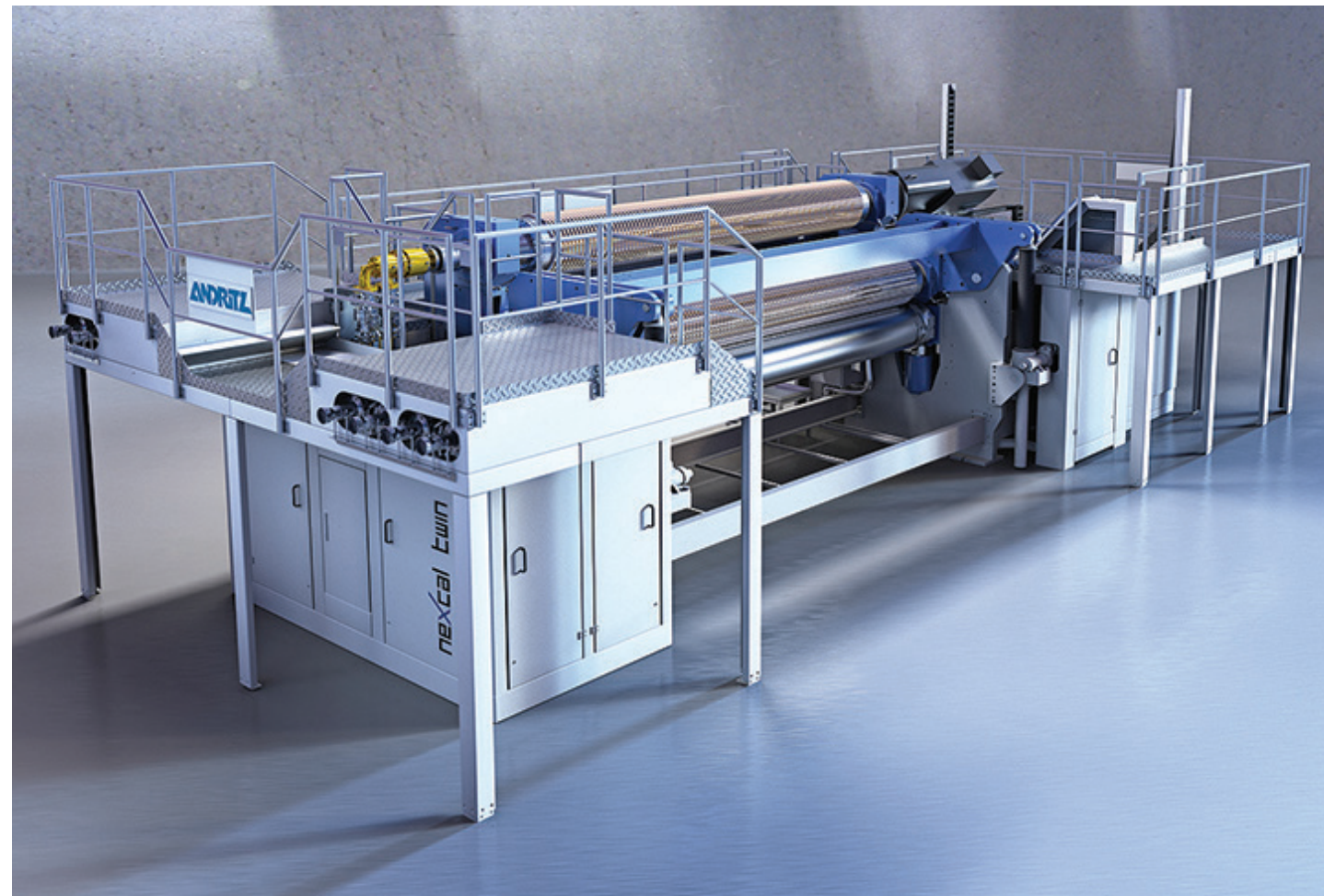


Design features

- Speed up to 1,250 m/min
- Line force adjustable (during production) up to 150 N/mm over the entire web width
- Three-roll arrangement with one roll in production and one roll in stand-by position
- Standard roll widths up to 5,800 mm (larger widths on request)
- neXtrend monitoring system

Some final product applications

- Hygiene
- Medical
- Filter



The benefit of being supreme

ANDRITZ neXcal quadriga

Our latest development takes you far beyond today's standards. Flexibility and highest possible uptimes combined with excellent product quality and stability are the market demands facing every cutting-edge nonwovens production plant. Our innovative calendering concept meets every demand – built to be supreme.

In a continuously changing nonwovens market, the demands of a first-class nonwovens production site are increasing constantly. Flexibility is a major factor. This is where our neXcal quadriga calender comes in. Its outstanding concept is a milestone in nonwovens production and offers a fast reaction to changing market requirements and product designs. Take advantage of unrestricted productivity, utmost flexibility, highest production stability, and excellent product quality and technology. Be the innovation leader for the next decade and leverage the nonwovens market with us.

What is the secret behind being supreme?

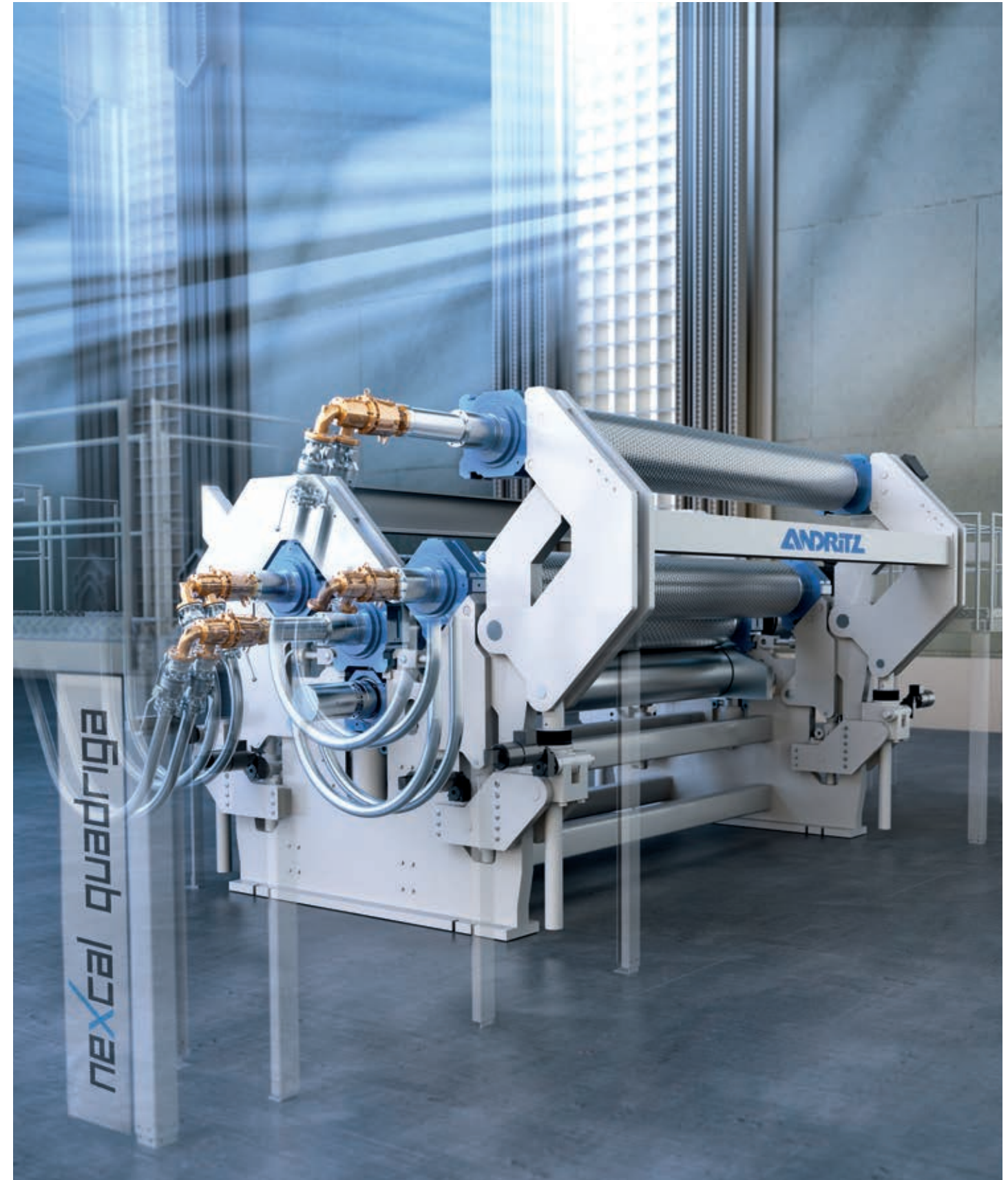
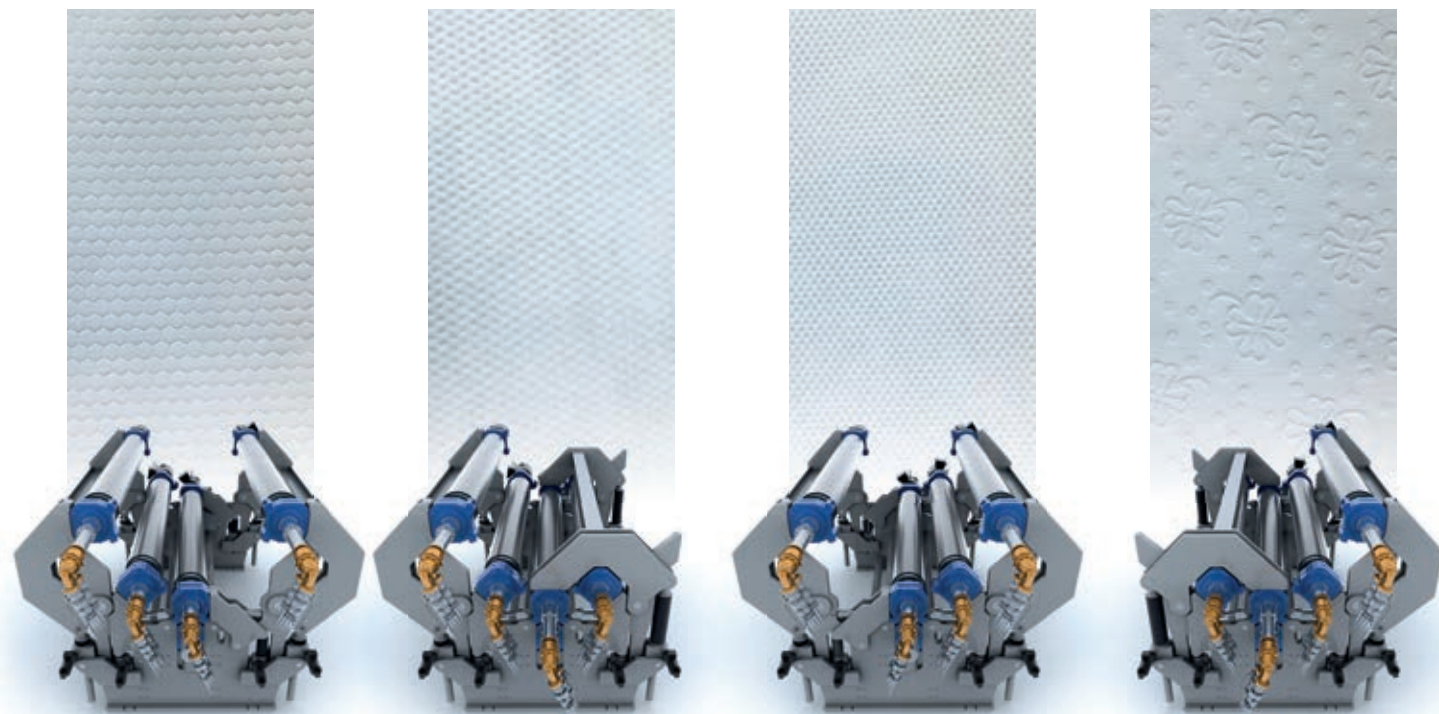
neXcal quadriga is a five-roll nonwovens calender with a Hot S-Roll in the bottom position and four embossing rolls with fully automated production change. Product change with a selection of four different patterns is possible within minutes without any break in production – efficient and reliable.

Design features

- Speed up to 1,250 m/min
- Line force adjustable (during production) up to 150 N/mm over the entire web width
- Five-roll arrangement with one roll in production and three rolls in stand-by position
- Standard roll widths up to 5,800 mm (larger widths on request)
- neXtrend monitoring system

Some final product applications

- Hygiene
- Medical
- Filter



The heart of our nonwovens calendering technology

ANDRITZ Hot S-Roll

As the first ever deflection-controlled roll in the world, the S-Roll revolutionized calendering technology for a wide range of applications. The heated roll surface ensures best results for multiple end uses.

Our heated Swimming Roll (Hot S-Roll) offers an almost unlimited number of applications. In thermobonding of nonwovens or other processes, such as embossing, perforating, laminating, or calibrating, the efficiency of the roll technology is crucial to the success of the final product. Our in-house manufacturing and long-standing expertise ensure highest quality and maximum flexibility. Continuous R&D adapts and optimizes the Hot S-Roll to meet the demands of the nonwovens market.

Take a peek behind the scenes

The roll is designed to follow the bending of the counter-roll and achieve maximum flexibility in your production operations. This allows rolls to be absolutely cylindrical and avoids friction. The roll has a fixed axle with a tube rotating around it. The inner part is divided into two chambers, allowing the roll shell to bend towards the counter-roll. Line pressure and temperature can be adjusted individually.

Hot S-Roll for high-speed production

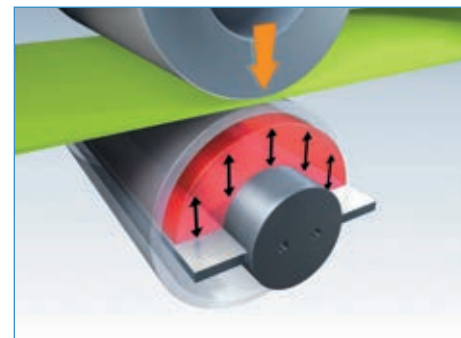
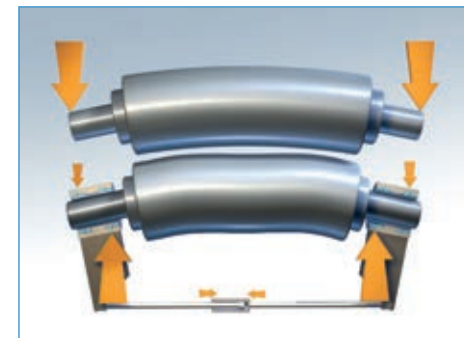
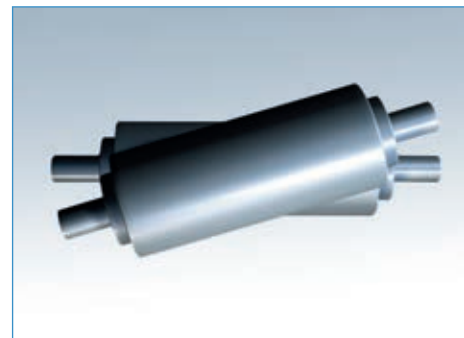
We have adapted our proven Hot S-Roll technology for state-of-the-art, high-speed nonwovens production up to 1,250 m/min. This includes a revolutionary concept with a contactless direct drive that is positioned directly on the roll. Easy heat insulation of the rotor and active cooling of the stator are ensured. Thanks to the small number of parts, the Hot S-Roll is highly reliable and requires little maintenance.

Calibrating

The CS-Roll is a special product in the heated Swimming Roll family. This deflection-controlled calibrating roll is used primarily in airlaid processes. By compacting and calibrating, the roll achieves thickness reduction, slight pre-bonding, less trapped air, and a precise definition of material thickness.

Design features

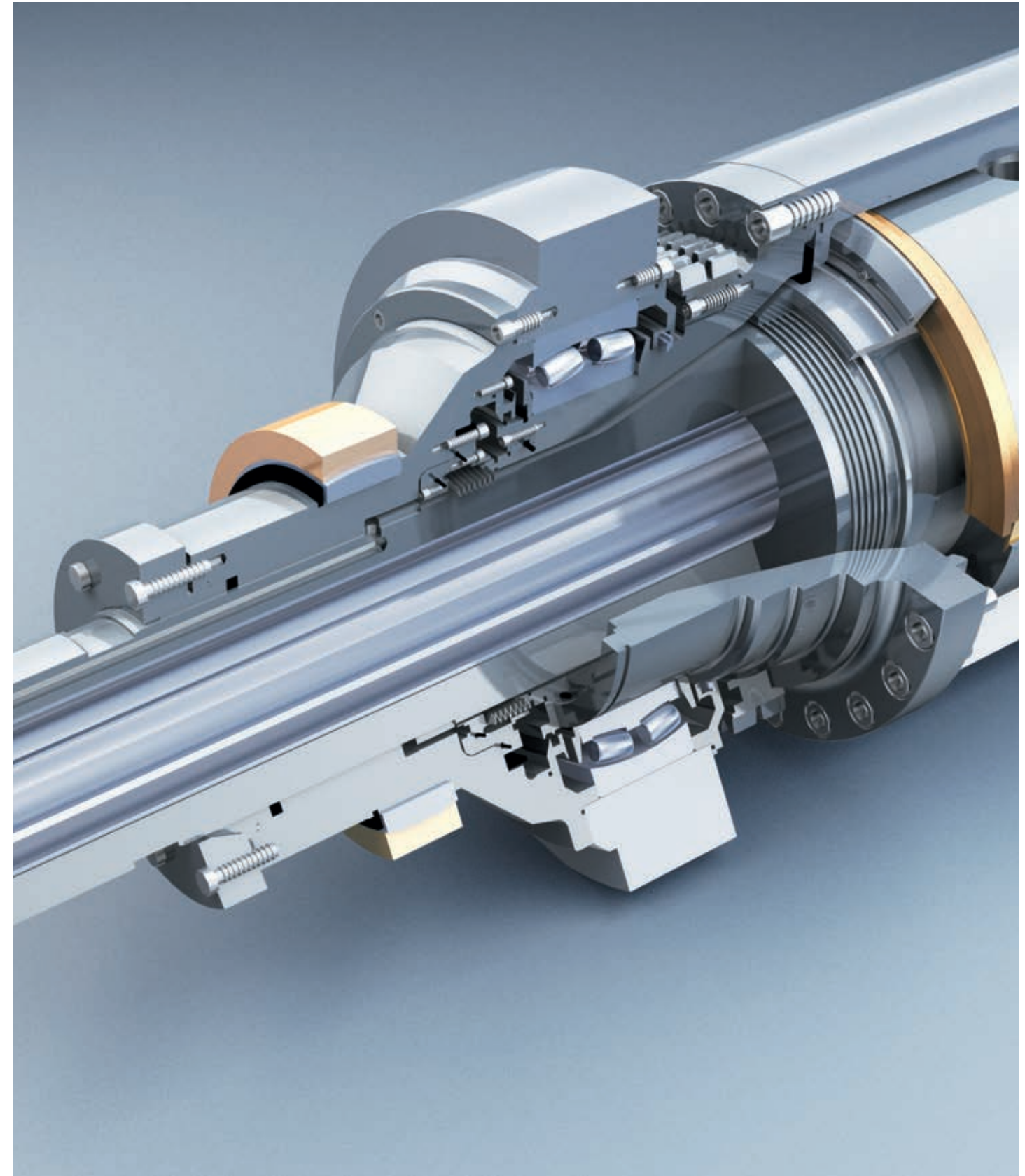
- Hydraulic pressure chamber
- Variable adjustment of fabric width
- Variable line force
- Correction: left – center – right
- Line force: 10-150 N/mm
- Surface temperature range 200 °C, 250 °C, 275 °C
- Roll surface width up to 7,000 mm
- Speed up to 1,250 m/min



▲ X-crossing

▲ Single roll bending

▲ Hot S-Roll



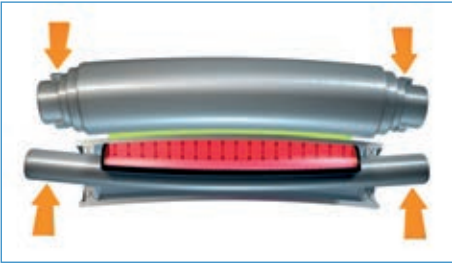
▲ Inside of the Hot S-Roll

ANDRITZ Hot S-Roll and CS-Roll

Technical data



▲ Hot S-Roll: Increased line force in center



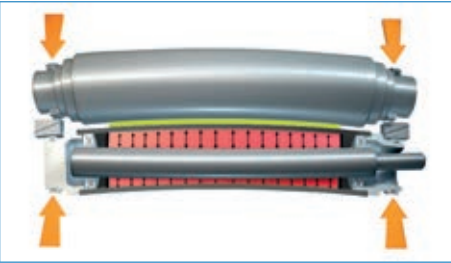
▲ Even line force at full fabric width



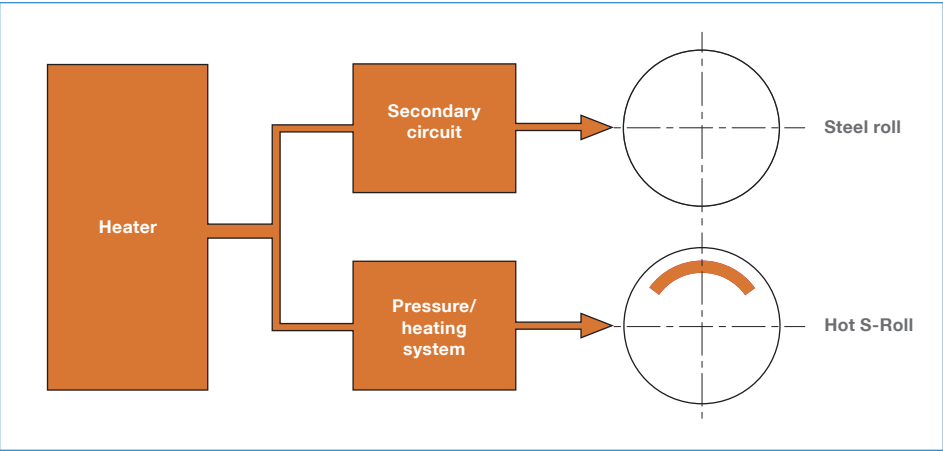
▲ Increased line force at the edges

Technical data of the heated S-Roll family

Roll type	Roll surface temperature	Speed	Fibers
Hot S-Roll 200	200 °C	up to 1,000 m/min	PP
Hot S-Roll 200 HS	200 °C	up to 1,250 m/min	PP
Hot S-Roll 250	250 °C	up to 1,000 m/min up to 300 m/min	PP or BICo PES
Hot S-Roll 275	275 °C	up to 1,000 m/min up to 300 m/min	PP or BICo PES
CS-Roll 170	170 °C	up to 600 m/min	BICo, blends



▲ CS-Roll



▲ Hot S-Roll heating system

The counterpart to the Hot S-Roll

The right counter-roll for your purposes

We select the right counter-roll fitted for your purposes, whether it is smooth or engraved, nitrogen- or induction-hardened. The diversity in final nonwovens applications creates different counter-roll requirements.

In the manufacture of smooth or engraved counter-rolls, different materials are selected according to the required hardness and surface finish. The individual application always determines whether to use nitrogen or induction hardening, special coatings, or hot grinding. The individual application determines the selection.

What roll material suits to your production best?

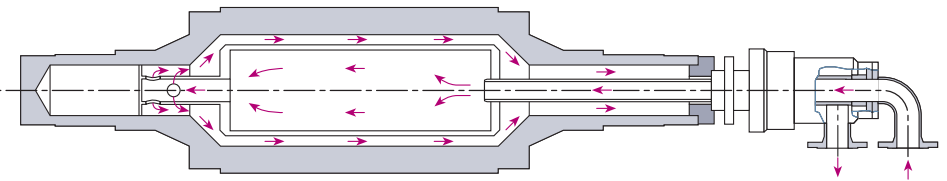
In standard thermobonding processes, a nitrogen-hardened, engraved roll has a hardness layer of 0.5-0.7 mm. The roll surface, and especially the engraving, is hardened and offers a solid surface to withstand small impacts. This provides high and reliable quality, keeping the efforts for re-engraving to a minimum.

For high-end production with outstanding quality requirements, an induction-hardened counter-roll is the best choice. The homogenous material allows induction hardening and results in a large number of re-engravings. The complete engraving and the roll body is hardened and has a hardening thickness of 5 mm. This provides a more robust roll surface to withstand impacts.

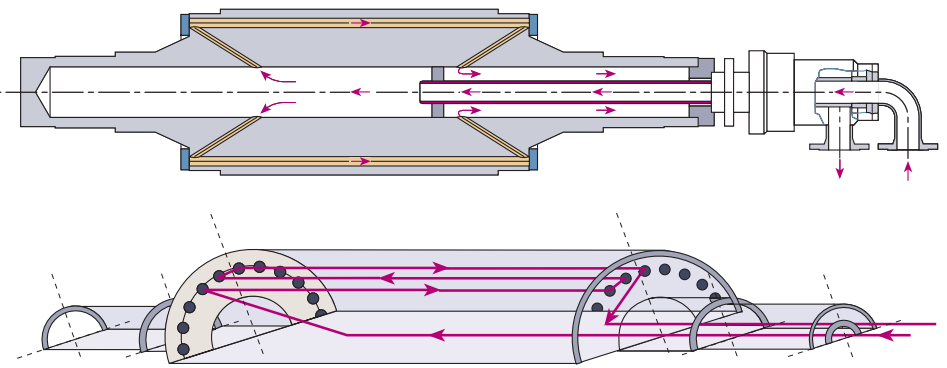
Central or peripheral bore?

Low-capacity nonwovens production of up to 9,000 t/a, speeds up to 450 m/min, and medium temperatures call for a central bore in the counter-roll. A temperature accuracy of $\pm 1\text{ }^{\circ}\text{C}$ over the entire web width ensures best quality and results.

For medium- and high-capacity nonwoven production of 9,000-24,000 t/a, a counter-roll with peripheral bore and a tripass system optimize the oil flow and energy transfer. Benefit from a short thermal reaction time and a temperature accuracy of $\pm 1\text{ }^{\circ}\text{C}$ over the entire web width.



▲ Central bore of counter-roll



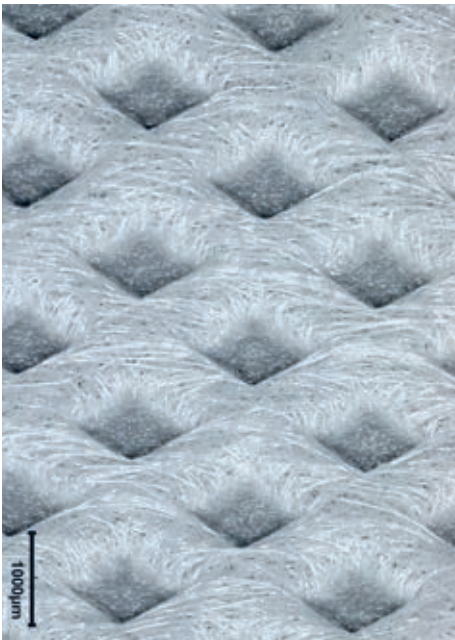
▲ Peripheral bore of counter-roll with tripass system

Complement each process with perfectly suited engraving

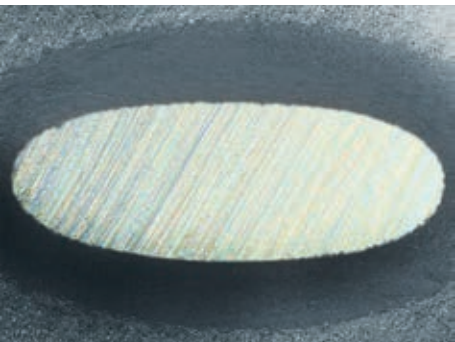
The multi-faceted nonwovens market with its unlimited scope of final applications demands different designs. Whether you need the perfect engraving for visual purposes only or to influence the product properties, we offer the precise engraving to complement your process.

Whether it is an oval, pyramid, dot, 3D, flower, or animal engraving, the right engraving provides the signature for the final application. Hygiene or medical applications require reliable strength and a defined MD/CD ratio. To ensure these parameters, the arrangement of engraving points needs to be exact. An oval design is most commonly used to provide these properties. Hygiene products are becoming softer and softer, and pressure marks are decreasing. A visual 3D look and more bulkiness can be achieved with special engravings. In a lamination process, dot engraving is the most suitable method. Whatever your needs and final application, we can provide the perfectly suited engraving.

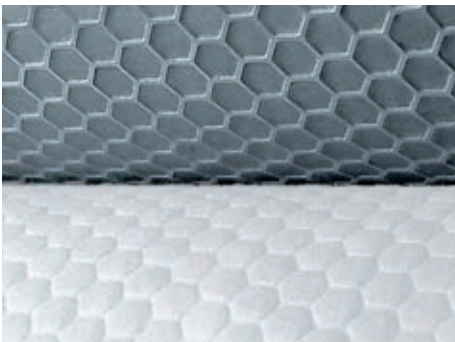
Nano surface treatment
Take advantage of the outstanding NTS ("Nano-to-surface" treatment) development for new and existing engraved rolls. Micro-engraving on top of the engraving reduces the amount of polymers adhering to the engraving valleys and flanks. This minimizes the risk of wrap-ups and the need for cleaning. Benefit from increased production times and reliability in calendering processes.



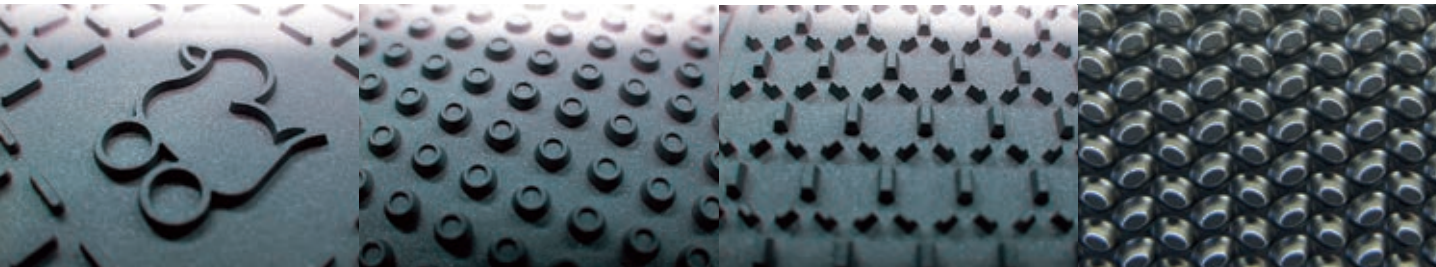
▲ Thermobonding under a microscope



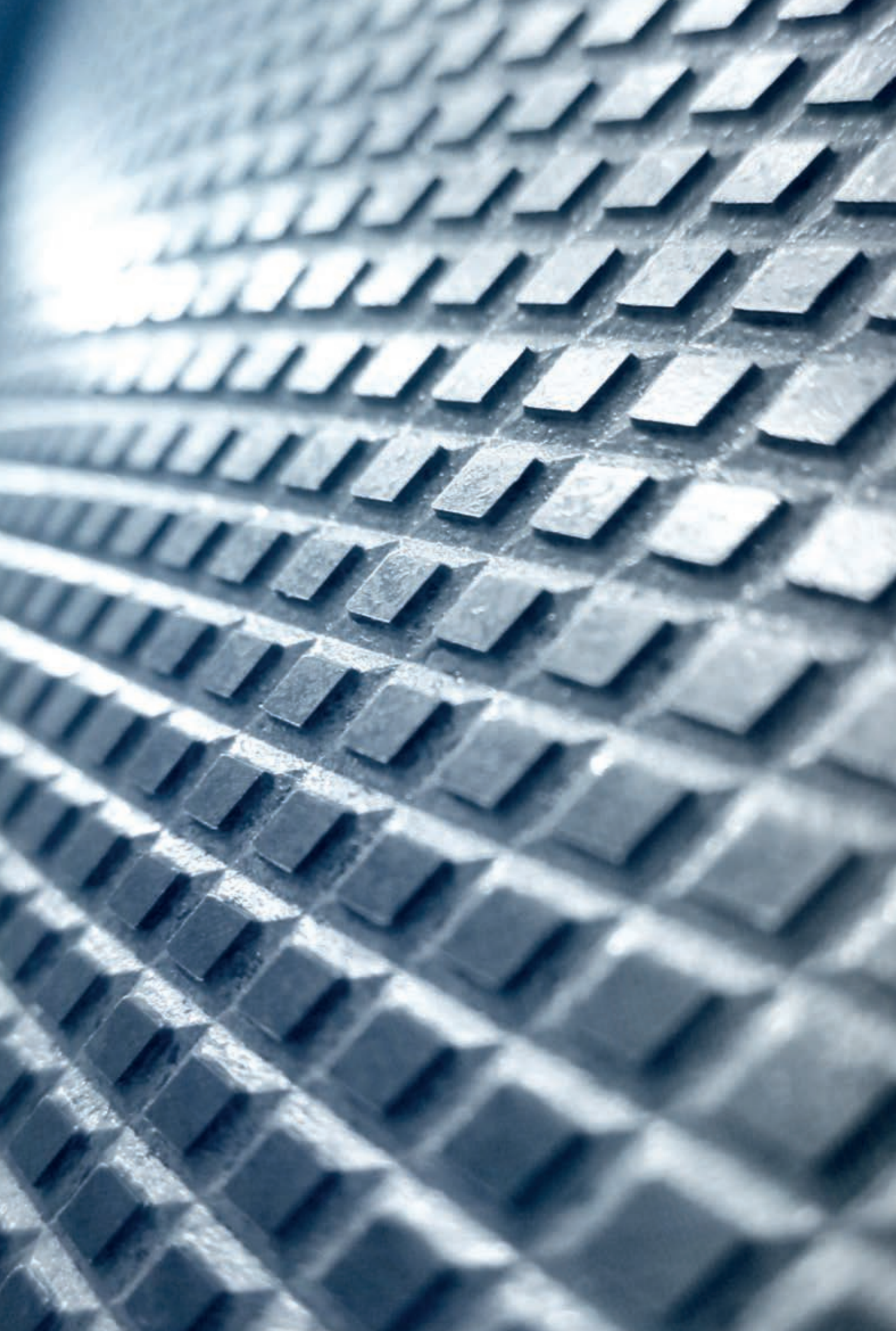
▲ Surface treatment NTS ("Nano-to-surface") before and after



▲ 3D-embossing



▲ Various nonwoven engraving options



Increase your process stability

Added value in quality and reliability

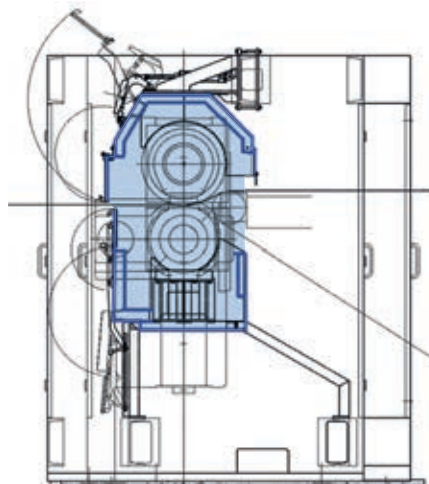
Obtain high product quality, best process reliability, and maximum energy efficiency during your high-end thermobonding process for spunbond nonwovens. To achieve these parameters, we have developed a roll housing and additional system insulation. This lifts your production to a new level of efficiency.

In an ever growing and more demanding nonwovens market, product quality, process reliability, and energy efficiency are major factors. Add value to your production with our housing and insulation concept. This ensures a constant temperature profile and stable conditions in your process. Gain from reduced polymer accumulation and wrap-ups, and from increased uptime. Save up to 43% in energy consumption and ensure efficient production operations.

A camera system located on the drive side and operator side keeps an eye on the thermobonding area to monitor your production process.

Benefits

- Maximized uptimes
- Minimized wrap-ups
- Highest energy efficiency
- Stable process
- Reduction of environmental impacts



▲ Roll housing

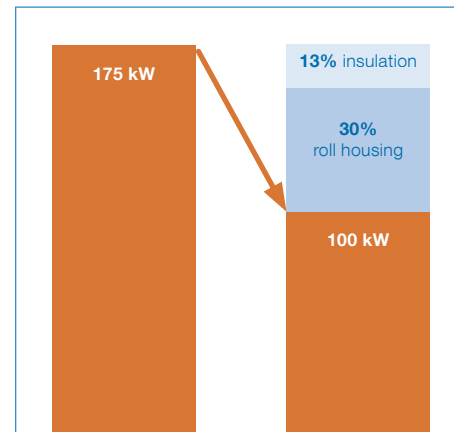
Energy savings with our housing and insulation concept

Production example:

Width 4,200 mm

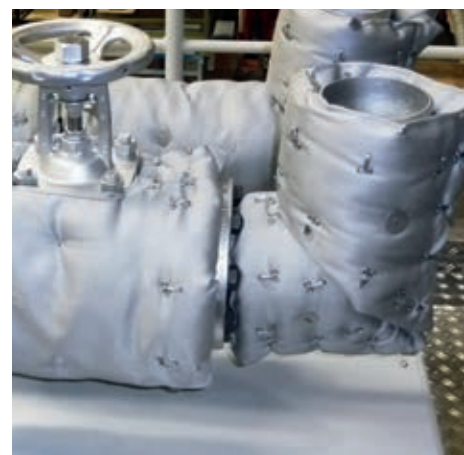
Speed 1,000 m/min

Fabric 10 gsm PP



▲ Basic design

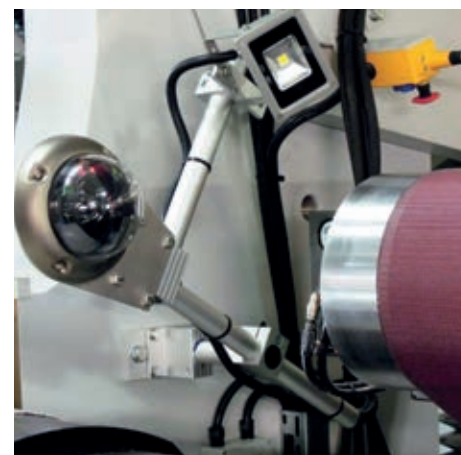
▲ Energy efficiency design



▲ Insulation



▲ Roll housing



▲ Camera system

Optimize your calendering process

ANDRITZ neXtrend monitoring system

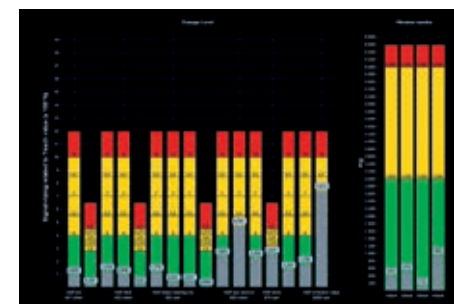
Our neXtrend monitoring system is well-prepared for Industry 4.0. Monitor the conditions of your machine equipment and forecast your maintenance schedule. Continuous and constant monitoring ensures top quality through automation.

Minimize your operation and maintenance costs with excellent process transparency. This avoids unforeseen shutdowns and damages, while improving your plant's global availability. Utilization of the operating components for the maximum period possible reduces your stock of spare parts. With our remote support service, we can provide comprehensive advice on your equipment.

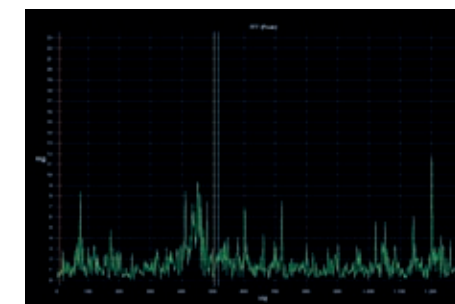
This predictive maintenance forecasts the probability of future functional issues by means of visual inspections. Rely on our process know-how and depth of engineering.

Benefits

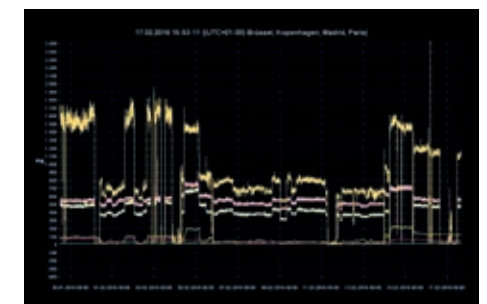
- Maximized production time
- Predictive maintenance
- Reliable process
- Ready for Industry 4.0
- Monthly report



▲ Diagnosis objects incl. warning system



▲ In-depth diagnosis



▲ History and trend analysis

From bonding to finishing

ANDRITZ neXline finish

We are committed to highest capability, reproducibility, reliability, and efficiency. Be it for thermobonding or for finishing processes, like embossing, compacting, lamination, or perforation, we provide the best solution, perfectly suited to your needs. Our solutions are not limited to calendering technologies, but also cover the complete finishing process – with neXline finish. This encompasses a calender, spunjet technology, a kiss-roll, and a dryer – turnkey solutions from just one source.



Spunjet

By combining two first-class bonding technologies, you gain from the spunlaid strength and spunlace softness. The spunjet process offers additional fabric properties in terms of softness, bulkiness, drape, tensile strength and isotropic MD/CD ratio.

Benefits

- Added product value
- Softness and bulkiness
- More flexibility
- New business opportunities

Low add-on

The comprehensive process concept of the neXkiss and neXdos offers a process-oriented solution guaranteeing highest product quality, production stability, and best possible liquor handling. This process can be used for low add-on, or for single-sided or double-sided application of hydrophilic finishes for the nonwoven top layers of diapers.

Benefits

- Excellent liquor pick-up
- Short web guiding
- Minimum fabric impact
- Maximum production stability

Drying

The neXdry system is a new generation compact dryer designed to meet spunbond and/or spunjet demands in terms of reliability, cost-efficiency, and easy maintenance access. The omega roll with a large open area of 96% optimizes the process performance.

Benefits

- High energy efficiency
- Extremely durable
- Dual temperature zones
- Quick and easy maintenance

Peak your production performance

Targeted development and service

Continuous research and development targeting your needs in an ever more demanding market. Ensure a fast, profitable, and sustained ROI with our highly skilled service engineers. You can benefit from more than 60 years' experience and expertise.

Research and development

Ongoing R&D provides multiple solutions to leverage nonwovens finishing technologies. Being dedicated to high quality and innovative production technologies propels us to seek ideal solutions. Let our combined forces achieve maximum results. Highly skilled staff provide the best and unique know-how drawn from our installed base and continuous R&D.

Research and development

We provide the best technology and round-the-clock service support for top performance. Your process value is guaranteed long after the warranty period has expired with ANDRITZ as your partner.

Reliable and prompt

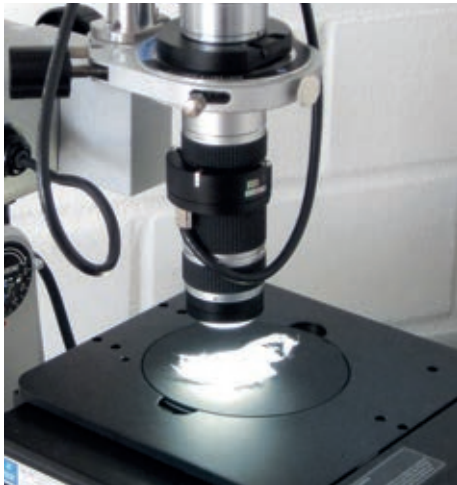
Our highly trained field and service engineers as well as our 24/7 hotline ensure best and prompt support. With our worldwide service centers, we are close to where you are – prompt and reliable.

Technical center

The state-of-the-art installations at our technical center in Krefeld and expert process engineers work with you to develop and ensure reliable technologies and process optimization. Evaluating new processes and defining parameters for product guarantees are yet another main focus.

Documentation

Operator-friendly machine documentation is available on an interactive tablet computer located where you need it. Find information quickly by using a full text search option. Our multimedia operating manual with pictures and videos helps you understand complex processes, and an integrated spare parts catalogue simplifies inquiries and the ordering process for any parts required.



CONTACT

GERMANY

ANDRITZ Küsters GmbH

Krefeld, Germany

Phone: +49 (2151) 34 0

FRANCE

ANDRITZ Asselin-Thibeu SAS

Elbeuf, France

Phone: +33 (2) 32 96 42 42

ANDRITZ Perfojet SAS

Montbonnot, France

Phone: +33 (4) 76 52 23 11

CHINA

ANDRITZ (Wuxi) Nonwoven Technology Co. Ltd

Wuxi, P.R. China

Phone: +86 (510) 8536 1269

INDIA

ANDRITZ Technologies Pvt. Ltd.

Chennai, India

Phone: +91 (44) 4293 9393

USA

ANDRITZ Küsters Division of ANDRITZ Inc.

Spartanburg, USA

Phone: +1 (864) 587 4848



www.andritz.com/nonwoven
nonwoven@andritz.com