Spunlace line solutions
Expertise, impact, and profitability
For more than three decades, ANDRITZ has led the technical innovations in the spunlace markets, which are continuing to grow. Expertise and commitment from our team create customized solutions to make your future successful.

A prosperous market
Since 2010, worldwide production in the spunlace process has jumped from 830,000 t/a to reach 1,336,000 t/a at the end of 2015. The worldwide capacity is expected to rise to 1,930,000 t/a in 2020 (EDANA source). This growth is mainly driven by the booming market for wipes. Spunlace fabrics are also used in a broad range of applications such as surgical gowns, cotton pads, hygiene, substrates for artificial leather, filtration, and automotive.

Unique characteristics
Spunlace fabrics are made from all types of raw materials – natural or synthetic. Softness, drape, comfort, conformability, high strength, and the fact that they contain no chemicals are the major characteristics that make spunlace nonwovens unique. In order to create nonwoven fabrics with new properties, hydroentanglement is used in more applications than just standard dry-laid lines. Thanks to ANDRITZ, producers also have the opportunity to combine hydroentanglement with other web forming processes, such as spunlaid, referred to as Spunjet, wetlaid, known as Wetlace, or airlaid, with the product name Airlace.

Trust a global partner
Today, ANDRITZ acts in the most of the worldwide spunlace production. Due to its continuous R&D efforts, with more than 70 patents available, ANDRITZ has introduced major innovations on the market since 1984, enabling the production of high-performance spunlace rolls. In order to meet the market demands, ANDRITZ offers a wide range of complete spunlace lines combining performance, efficiency, and profitability.
A wide range of solutions
neXline spunlace

ANDRITZ offers multiple layout configurations to produce different types of spunlace fabrics.

The neXline spunlace eXcelle is the premium line layout, combining very high capacity of up to 25,000 t/a and low energy consumption.

<table>
<thead>
<tr>
<th>Line types</th>
<th>Fabrics</th>
<th>Line speed</th>
<th>Working width</th>
<th>Capacity</th>
<th>End uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>20-120 gsm</td>
<td>up to 400 m/min</td>
<td>5.0-6.0 m</td>
<td>25,000 T/a</td>
<td>wipes, medical, hygiene</td>
</tr>
<tr>
<td>Crosslapping</td>
<td>30-400 gsm</td>
<td>up to 100 m/min</td>
<td>7.0 m</td>
<td>7,000 T/a</td>
<td>automotive, artificial leather, filtration, e.o.</td>
</tr>
</tbody>
</table>

The neXline spunlace aXcess is a proven design to process nonwovens in the capacity range up to 12,000 t/a at low operating costs.

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</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>30-100 gsm</td>
<td>up to 200 m/min</td>
<td>3.6 m</td>
<td>12,000 T/a</td>
<td>wipes, medical, hygiene</td>
</tr>
<tr>
<td>Crosslapping</td>
<td>30-250 gsm</td>
<td>up to 75 m/min</td>
<td>3.6 m</td>
<td>5,000 T/a</td>
<td>industrial, filtration, coating substrates</td>
</tr>
</tbody>
</table>

The direct line configurations are mainly designed for lightweight spunlace fabrics.

For more durable end uses, crosslapping line configurations are preferred.
System supply capabilities
All components in harmony

As the market becomes more and more competitive, producers need to be focused on their core business, which is efficient production, marketing, and sale of nonwoven roll goods. ANDRITZ offers fully engineered solutions to help producers choose the right equipment to save time and money.

Single-source solution
The heart of the ANDRITZ expertise lies in arranging and configuring the main process components in a production line so that they work in harmony to deliver the exact end product desired. ANDRITZ system supply services ensure that nonwovens manufacturers have a cost-efficient, flexible, and reliable spunlace line covering the full spectrum, from fiber opening/blending to finished rolls. Spunlace fabrics combine web characteristics (Machine Direction / Cross Direction ratio, bonding index, and thickness), line performance (productivity, energy consumption, water treatment), and web uniformity.

Full project management
Important added-value from ANDRITZ is full project management, from planning control to reduce the delivery time, to start-up of the line and securing a prompt return on investment. Savings on raw materials and utilities will be reflected in your operating margin. The expertise of ANDRITZ in this field has a direct impact on your fibers and on power and water consumption in each stage of your process.

Benefits
- End fabric warranty
- Energy consumption guarantee (kWh/kg)
- Coherent integrated engineering
- Budget control
- Shorter time to production
- Complete line guarantee
- Single contact person

All key advantages thanks to the unique ANDRITZ offering
Unique features of ANDRITZ spunlace lines
Always a step ahead

On the basis of its experience and expertise, ANDRITZ is able to offer a wide range of innovative solutions in standard spunlace lines, but also in sophisticated nonwovens processes. The passion of the ANDRITZ team results in an original approach in day-to-day business. ANDRITZ knows that each customer is unique, so we always provide an alternative solution to produce customized nonwoven fabrics that meet different market demands.

Market knowledge
Thanks to our wide network of players in the nonwovens supply chain, from raw material suppliers to converters, ANDRITZ can offer in-depth expertise in spunlace line solutions. In addition, we can advise you on product characteristics such as web uniformity, patterning solutions, and fabric thickness to provide you with a competitive advantage.

Lower energy consumption
In order to make significant reductions in energy consumption, ANDRITZ offers its neXecodry drying solution, which is a combination of dewatering and drying technology. ANDRITZ has also developed a high-efficiency squeezing device named neXaqua. In combination with the suction device, neXaqua dewatering system reduces residual moisture in the web considerably. This leads to remarkable energy reduction in the subsequent drying process. In addition, the hydroentanglement configuration with state-of-the-art slot injector design is among the key equipment in reducing energy consumption. The complete spunlace line, neXline spunlace, from ANDRITZ is able to save up to 20% of the electrical power otherwise consumed and up to 30% of the thermal energy.

Ultralight products
One of the new trends in the hygiene market is to supply lighter spunlace fabrics with perfect uniformity. The combination of the famous web forming TT card and the well-known Jetlace hydroentanglement unit is the only technical solution to meet this new market demand as well as operating at very high speed. Nonwovens producers are now able to achieve 20 gsm and even less for their ultralight spunlace fabrics.

Spunjet process
Spunjet technology produces a new generation of nonwovens with superior properties, such as bulk and softness. In addition, Spunjet extends the spunbond technology range to offer manufacturers greater flexibility with unique softness properties. It also yields a key advantage in hygiene applications. Spunjet has the perfect design for the spunlaid process in terms of speed (up to 1,000 m/min) and reliability.

Industry 4.0 for smart production
The aim of the ANDRITZ solutions is to guarantee smooth operation and improve the processes and plant profitability. ANDRITZ developed smart a technology called ASIT (ANDRITZ Smart Industrial Technology), which is able to control the line parameters and manage the recipes for approved production. ASIT gives full intelligence to the operating system.

Benefits
- Team of expert process engineers
- Comprehensive process solutions
- Energy-efficient process
- Customized design lines
- High-speed lines
- Comprehensive automation solutions

Complete control system to manage the nonwovens production line

Spunjet process, a key advantage in hygiene applications
ANDRITZ cards
Fitting in with market needs

ANDRITZ offers comprehensive solutions for every kind of drylaid web forming process. Several ranges of cards are available, depending on the line configuration, for a direct or crosslapping layout. The aXcess and eXcelle cards cover all possible market requirements in terms of capacity or web properties.

eXcelle cards
eXcelle cards are designed for high production levels. They are available in working widths of up to 5.1 m and for different delivery configurations. This card provides the best solutions to meet producers’ requirements in terms of throughput and web characteristics. The eXcelle cards can be fitted with one, two, or three doffers – VarioWeb. The eXcelle cards are also equipped with reliable take-off devices so the delivery speeds are adapted to any crosslapper infeed capabilities, while maintaining the card web structure.

eXcelle TT cards
A revolutionary design within the ANDRITZ eXcelle range is the TT card with dedicated carding rolls configuration. It provides very good web uniformity and improves MD/CD ratio homogeneity at high speed. This card is designed to meet the expectations of wipes producers and can produce non-wovens at top speed of up to 400 m/min. The state-of-the-art design, with quick and easy accessibility for maintenance and service, is very user-friendly.

aXcess cards
Based on proven technology, ANDRITZ aXcess cards are designed for medium production levels. They are available in 2.5, 3.0 or 3.75 m working width with two different delivery configurations – parallel or condensed. In a crosslapping line layout, the delivery speeds are adapted to the crosslapper infeed speeds of up to 100 m/min. The aXcess VarioWeb card is an alternative choice, depending on the web characteristics, for a direct line process with a speed of up to 170 m/min.

Benefits
- A full range of solutions
- Perfect web uniformity
- Available for very high speed lines
- User-friendly
- Quick and easy accessibility
**ANDRITZ crosslappers**

**Experience and innovation**

The ANDRITZ crosslapping technology is based on 60 years of experience and continuous innovations. The crosslappers can be provided for cards with up to 3.5 m working width and for delivery aprons up to 15 m wide. All transfer carriages and aprons have individual motors in order to control the batt weight distribution. ANDRITZ offers two crosslapper ranges, depending on the line configuration.

**Profile**

This crosslapper is designed for production lines requiring higher productivity and web profile improvement. Its short textile path configuration allows an input speed of up to 170 m/min.

**Dynamic for ProDyn**

ProDyn is designed for Dynamic Excelle cards equipped with a scanning gauge and fully automatic closed loop control. The Dynamic crosslapper combines the Profile crosslapper and the ProDyn capabilities. The unique ProDyn system optimizes the weight profile and allows fiber saving. With this controlled loop, weight evenness expressed as CV% is reduced by two thirds. In addition, the Isolayer system is able to absorb the speed difference at the outlet conveyor of the crosslapper, it improves overlap, and has a faster running speed. The Isolayer creates a more balanced shrinkage effect over the entire fabric width.

**Benefits**

- High-speed performance
- Improved batt weight distribution
- Fiber saving
- Greater homogeneity of the web
- Low maintenance requirements

**ANDRITZ drafters**

**Perfect control of the nonwoven webs**

A very large range of ANDRITZ batt drafters ensures perfect control of the product throughout the spunlace process.

**Batt drafters**

ANDRITZ provides models with 9 to 27 rolls and with or without integrated by-pass system. These drafters allow fiber reorientation in machine direction (MD) to obtain a more isotropic and stronger, final nonwoven fabric and also higher throughput in production.

**Benefits**

- Full range of configurations
- More isotropic and stronger fabric
- Higher productivity

### Web profile with ProDyn system

- Superfluous fiber with standard web forming
- Save up to 5 to 7% of fibers thanks to the ProDyn system

### Web profile with ProDyn system
ANDRITZ Jetlace portfolio
State-of-the-art hydroentanglement units

As a result of its unique experience in the spunlace industry, ANDRITZ offers the widest range of Jetlace hydroentanglement units to cover the needs of all nonwovens producers around the world.

JetlaceEssentiel
JetlaceEssentiel is perfectly designed to produce lightweight and ultra-lightweight fabrics from 20 to 120 gsm at very high speeds of up to 400 m/min. JetlaceEssentiel is ideal for the production of most synthetic/natural lightweight fabrics for hygiene, medical, and wipes applications. Scaled to meet various line capacity requirements, machines are available in 3.75, 4.00, 4.25, 4.5, and 4.75 m widths.

JetlaceEvolution
JetlaceEvolution is perfectly designed to produce lightweight fabrics from 20 to 120 gsm at very high speeds of up to 400 m/min. JetlaceEvolution is available in widths up to 4.5 m and is able to produce spunlace fabrics from 20 to 400 gsm.

JetlaceAvantage
JetlaceAvantage is recognized as the new standard for growing markets and is perfectly optimized to produce spunlace fabrics from 30 to 120 gsm for wipes and medical uses. JetlaceAvantage is available in 2.5 and 3.6 m widths. Designed with two or three cylinders, this standard machine can produce state-of-the-art spunlace fabrics at up to 200 m/min.

JetlaceCottonPad
JetlaceCottonPad is the hydroentanglement system for production of cotton pads and cotton wipes. It retains bulk and delivers perfect surface evenness. And it is compact in size, with widths up to 3.6 m and a product range from 30 to 270 gsm. In order to customize cotton pad and cotton wipe fabrics with creative patterns, spunlace producers can add the optional patterning or aperture system known as Perfojet Unit.

Jetlace3000
The Jetlace3000 can be fully customized and meet virtually all production requirements in terms of capacity, line speed, fabric weight, and machine width. Jetlace3000 is perfectly designed to manufacture nonwoven fabrics for filtration, industrial wipes, agricultural, and surgical applications. It can operate at up to 1,000 m/min and is available in widths of up to 7.0 m.

Benefits
- Customized design
- Compact configuration
- Low energy consumption
- Widest hydroentanglement unit
- User-friendly
- Low maintenance

Hydroentanglement units

<table>
<thead>
<tr>
<th>Units</th>
<th>Fabric grammage</th>
<th>Line speed (at winder)</th>
<th>End uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>eXcelle units</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JetlaceEssentiel</td>
<td>20-120 gsm</td>
<td>up to 400 m/min</td>
<td>wipes, medical, hygiene</td>
</tr>
<tr>
<td>JetlaceCottonPad</td>
<td>30-140 gsm</td>
<td>up to 100 m/min</td>
<td>cotton wipes, hygiene</td>
</tr>
<tr>
<td></td>
<td>140-270 gsm</td>
<td>up to 70 m/min</td>
<td>cotton pads, hygiene</td>
</tr>
<tr>
<td>JetlaceEvolution</td>
<td>30-400 gsm</td>
<td>up to 200 m/min</td>
<td>automotive, artificial leather, filtration, e.o.</td>
</tr>
<tr>
<td>Jetlace3000</td>
<td>30-800 gsm</td>
<td>up to 1,000 m/min</td>
<td>industrial, surgical, agriculture, insulation, filtration, apparel, e.o.</td>
</tr>
<tr>
<td>aXcess unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JetlaceAvantage</td>
<td>30-120 gsm</td>
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JetlaceEssentiel for lightweight fabrics production at very high speed
Jetlace3000 configuration for the Wetlace lines
ANDRITZ injectors
The heart of the spunlace process

Injectors are considered one of the critical points of the spunlace process. Thanks to its perfect know-how in fluid mechanics and robust manufacturing, ANDRITZ installs state-of-the-art injectors in its hydroentanglement units. ANDRITZ technology and equipment always provide optimum quality at very low energy consumption.

Top-quality needling water is ensured by the advanced design whereby the water is distributed through a patented, continuous slot inside the ANDRITZ Jetlace injector. Process engineers use the latest computer-based fluid mechanics modeling tools to optimize the injector efficiency. In addition, the process water undergoes final filtration by the EXH cartridge inside the injector body just before the water enters the needle strip.

Benefits
- Perfectly homogeneous distribution of water
- Lower operating costs
- Final filtration of process water just before the strip (filter inside the injector)
- Quick access to the strip and the filtration cartridge
- Drip-tray, additional vacuum system, to avoid water marks

Efficient water recirculation and filtration
High quality sub-systems

Another critical point in the spunlace process is treatment of the water. Due to the large amount of water required, it is essential to recycle and recirculate it.

A high-quality filtration system is necessary. The recycling ratio can be up to 99% with the most advanced filtration systems. ANDRITZ has developed the sub-systems to treat and filter suspended solids and spin-finish water. One priority is to optimize the filtration process for synthetic and/or natural fibers.

The filtration process is optimized by removing all the particles, from the largest down to the finest, when the process water passes through the main filtration systems:
- Flotation cell (FL)
- Band filters (BD)
- Sand filters (FSS)
- Bag filters (FP)
- Press filter (PF)
- etc.

Benefits
- Highest fabric quality
- Full process guarantee
- Reduced water consumption
- Minimal wastewater discharge
- Low chemicals consumption
- Increased line efficiency
- Reduced maintenance downtime

Optimization of the water filtration system

92% recycled
97% recycled
99% recycled
Patterning solutions
Customize your spunlace fabrics

The market trend demands product diversification. ANDRITZ has developed a series of patterning and aperture sleeves or thermos-embossing calenders to create unique designs, surface haptics and functions on spunlace, Airlace, and Wetlace fabrics.

neXimaging sleeve
The latest patterning sleeves use neX-imaging technology, which allows full customization of spunlace fabrics with the reproduction of virtually any logo or pattern in high-quality detail. Logo and pattern definition are enhanced, while optimum production speeds are maintained. Logos can be designed to customer requirements, and neXimaging also allows perfect creation of apertures on the web.

Perfojet Unit
ANDRITZ has developed an innovative process to apply special and unique artwork to flushable wipes – the Perfojet Unit. This enables wipes producers to distinguish their product by showing the correct disposal method in combination with consumer-friendly branding.

Thermo-embossing calenders
The ANDRITZ product portfolio in patterning solutions is rounded off by our wide range of thermo-embossing calenders. Whenever very precise and permanent embossing is required, especially when using fusible fibers, calender embossing is the preferred process for a multitude of applications. ANDRITZ deflection-controlled calender systems are state-of-the-art in thermo-embossing and can be executed as a two-roll calender in vertical roll arrangement or, for ultimate production flexibility, as twin execution.

Benefits
- Innovative solutions for patterning and aperture
- Unlimited number of possible patterns
- Any 3D shape and texture

Some examples of patterning and aperture possibilities.
Innovative drying solutions
High efficiency combination
ANDRITZ supplies its own through-air dryer technology to meet the highest performance levels for nonwovens lines. The dryers excel by achieving high nonwovens product quality while saving energy.

neXecodry system
The neXecodry drying technology, a combination of dewatering and drying technology, was designed by ANDRITZ to make significant reductions in the energy consumption of existing spunlace, Wetlace (wetlaid and hydroentanglement), and Airlace production lines. Nonwovens producers achieve better quality fabrics with higher bulk and no pattern degradation.

neXdry
neXdry is a through-air dryer designed and manufactured by ANDRITZ and available for spunlace, Wetlace, spundown, and Spunjet processes at very high production speeds. It features high evaporation capacity and low power consumption.

neXdry Avantage
neXdry Avantage drying technology is designed by ANDRITZ in Europe and made in the ANDRITZ facilities in China. This efficient dryer is the perfect solution to meet the demands of spunlace producers using aXcess lines for a capacity range up to 12,000 t/a.

Perfordry 3000
Perfordry 3000 is well-known in the spunlace, Wetlace, and Airlace processes. It removes up to 1,300 l/h.m of moisture at the high throughput speeds in modern spunlace lines. Designed to provide optimum drying, the Perfordry 3000 has a simple and durable design.

Benefits
- Up to 35% energy savings
- Premium quality nonwovens
- Easy to use
- Roll-in/roll-out design
- Extremely durable
- Compact design
- Low operating cost

Technical support and competence
From development to order execution
The ANDRITZ technical center provides support for trials, product development, marketing tests, training, and other services for the spunlace industry. The pilot line is equipped with the latest developments available on the market.

Customer-oriented
To support spunlace producers with their own R&D, ANDRITZ offers a full technical center, including all types of services, such as trials for product development, technical training of operators, or production for marketing tests. ANDRITZ process engineers assist customers in evaluating new processes and products, and in establishing the right parameters for their nonwovens fabric guarantee.

Research and development
The spunlace pilot line is an essential part of the ANDRITZ R&D strategy. Thanks to this unique technical center, process experts are able to develop new products for the market of tomorrow and find advanced technical solutions to improve line efficiency. Spunlace producers benefit directly from ANDRITZ R&D investments.

Pilot line characteristics
- Opening and blending
- TT card for web forming
- Jetlace for hydroentanglement
- Airlace for hydroentanglement of Airlaid web forming
- Perfojet Unit for patterning
- neXaqua for dewatering
- Kiss roll for low add-on
- neXecodry system for energy saving
- Perfordry 3000, through-air dryer
- Winder

Benefits
- Process expert support
- Equipment containing the latest technology
- Integrated laboratory to test nonwoven fabrics
- Simulation tool
Responsive service
Maintain your competitive edge

ANDRITZ supports its customers and provides a full range of services in order to protect spunlace producers’ competitive edge in the long term. The ANDRITZ goal is to ensure that nonwovens producers maintain fast and sustained profitability through a strong and durable partnership with ANDRITZ.

Spare parts
To keep your nonwovens equipment at peak performance, ANDRITZ recommends its customers to use only genuine parts from ANDRITZ. All strategic parts are tested and approved before shipment to ensure top performance of industrial spunlace lines. Producers have dedicated contacts within ANDRITZ, which ensures a prompt response when meeting their requirements.

On-site support
In order to provide the best and fastest service to spunlace producers, ANDRITZ Nonwoven has several service centers with worldwide coverage, where process experts and engineers work in one team. The ANDRITZ commitment to excellence in services includes reliable answers to technical questions and a fast response whenever there is a need.

Benefits
- Added-value solutions
- Comprehensive expertise
- Technical analysis by experts
- 24/7 support with hotline
- Service centers around the globe
- Local contacts

Upgrades and modernizations
ANDRITZ offers complete upgrade solutions to improve line capability and ensure that the producer’s business is profitable. The in-depth technical skills of ANDRITZ engineers can provide advanced upgrade and modernization solutions for complete production lines. ANDRITZ customers will always be a step ahead thanks to the innovative solutions offered.

Training
The ANDRITZ scope of services also includes training of the operating personnel. The success of the production lines is primarily due to having well-trained operators who are able to adjust the various production parameters, but also to work on all components and optimize their performance over time. Training can be provided at the ANDRITZ technical center or on-site by local ANDRITZ experts.

Energy savings
For decades, ANDRITZ has worked on its Jetlace unit in order to offer the perfect hydroentanglement configuration according to production needs. Thanks to its patented pre-wetting configuration and the unique design of the injectors, producers are able to reduce energy consumption. In drying technology, ANDRITZ launched an innovative solution combining the de-watering unit and the through-air dryer – the neXecodry system. This latest development optimizes the vacuum level in the de-watering process and reduces the energy consumption by the dryer. Depending on the fabric characteristics and thanks to neXecodry, spunlace producers can save up to 35% of the energy formerly required.

Fiber savings
Raw material savings and waste recovery form the main focus of efforts to provide spunlace producers with a fast return on investment. Indeed, fibers could account for up to 70% of their production costs. In terms of waste recovery, the edge trim recycling solution from ANDRITZ has a direct impact on your operating margin. This system is inserted at different points in the line, from carding to the winder. In addition to fiber recycling, the ANDRITZ spunlace line configuration produces lighter nonwoven fabrics by combining a good MD/CD ratio with the right thickness, which results directly in fiber savings.

Save resources and boost your profits
Improve your environment

One of ANDRITZ’s responsibilities is to create a lasting balance between productivity and environmental protection. By uniting expertise and experience in complete line production, ANDRITZ Nonwoven has developed specific technologies that contribute actively to reducing energy consumption and waste.

Water recycling
The spunlace process uses a large amount of water, and the ANDRITZ water filtration system helps spunlace producers to obey local regulations concerning water recycling and minimize the loss of costly rejects. ANDRITZ’s targets are to provide a complete water recirculation solution by reducing water consumption and using a very limited amount of chemicals. For many years now, ANDRITZ process experts have been able to reduce dramatically the quantity of biocide in the filtration system.

Compact machine
In order to reduce the carbon footprint, ANDRITZ has worked on the line layout and offers compact solutions. At the same time, ANDRITZ was able to reduce the required space and enhance performance of the spunlace line. Productivity has more than doubled, while the required space has been reduced by 33%. The reduced area allows savings in the building investment and in operating costs for air conditioning, heating, lighting, or maintenance of your factory.