*Prime*Line
TISSUE MACHINES

For dry-crepe, textured,
and structured tissue

ANDRITZ

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Your experienced partner for efficient tissue production

The global tissue market continues to grow and is a dynamic sector within the paper industry. ANDRITZ is a major supplier across the industry, from stock preparation to the reel, and from conventional tissue machines through to the latest technology for premium-quality products.

ANDRITZ Pulp & Paper is an experienced and proven partner to the global tissue machine industry. Through continuous development and project experience around the globe, ANDRITZ offers world-class tissue machinery and components with innovative features. Experience at production speeds exceeding 2,000 m/min, high-quality paper grades and advanced solutions to reduce overall energy consumption form the basis of our offerings.

“We offer complete lines, key components, and services — from stock preparation to the reel.”

GERALD STEINER
Senior Vice President Paper & Tissue
ANDRITZ

COMPLETE LINES - REBUILDS - KEY COMPONENTS

ANDRITZ can supply complete turnkey production lines from bale handling to reel, and, if needed, also rewinding and roll handling. We offer all the technologies including complementary air and energy systems, sophisticated automation and electrification solutions, complete life-cycle services as well as best-in-class tissue machine clothings. Our equipment, such as pulpers, refiners, screens, cleaners, headboxes, shoe presses, Yankees and hoods, is manufactured in our own ANDRITZ workshops. In additon to our turnkey solutions, we also offer the full portfolio of advanced Metris digital solutions, which help our customers in the digital transformation of their tissue production line.

SERVICES AND REMOTE ASSISTANCE

Apart from commissioning and start-up assistance, as well as optimization after start-up on site, ANDRITZ can provide dedicated remote support. From our Metris Performance Center in Graz, we can fully support the operators on site, optimize the customer’s plant, adjust and change settings. The Metris Performance center can take over all functions of the customers control room and operate all of the equipment remotely if need be.

Our Metris OPP (Optimization of Process Performance) services provide a clear advantage for tissue producers to maximize efficiencies across their mills. These services are accompanied and safeguarded by cyber security solutions, artificial intelligence, preventive and predictive maintenance, as well as many other services.

PILOT PLANT

The *Prime*LineTIAC, Tissue Innovation and Application Center, enables our customers to develop the right tissue product together with us for their customers. The center is located at our headquarters in Graz, Austria, and features a tissue machine of utmost flexibility: eight different configurations (shoe press, steel Yankee, TAD drums) for industrical-scale trials for the production of dry-crepe, textured, and structured (TAD) tissue.

WATCH THE VIDEO
on our tissue technologies and services

*Prime*Line: a tissue machine for every need

*Prime*Line tissue machines are available as *Prime*LineCOMPACT, *Prime*LineTM, *Prime*LineTEX, and *Prime*LineTAD (Through-Air Dried). The graphic below shows their speeds and widths.

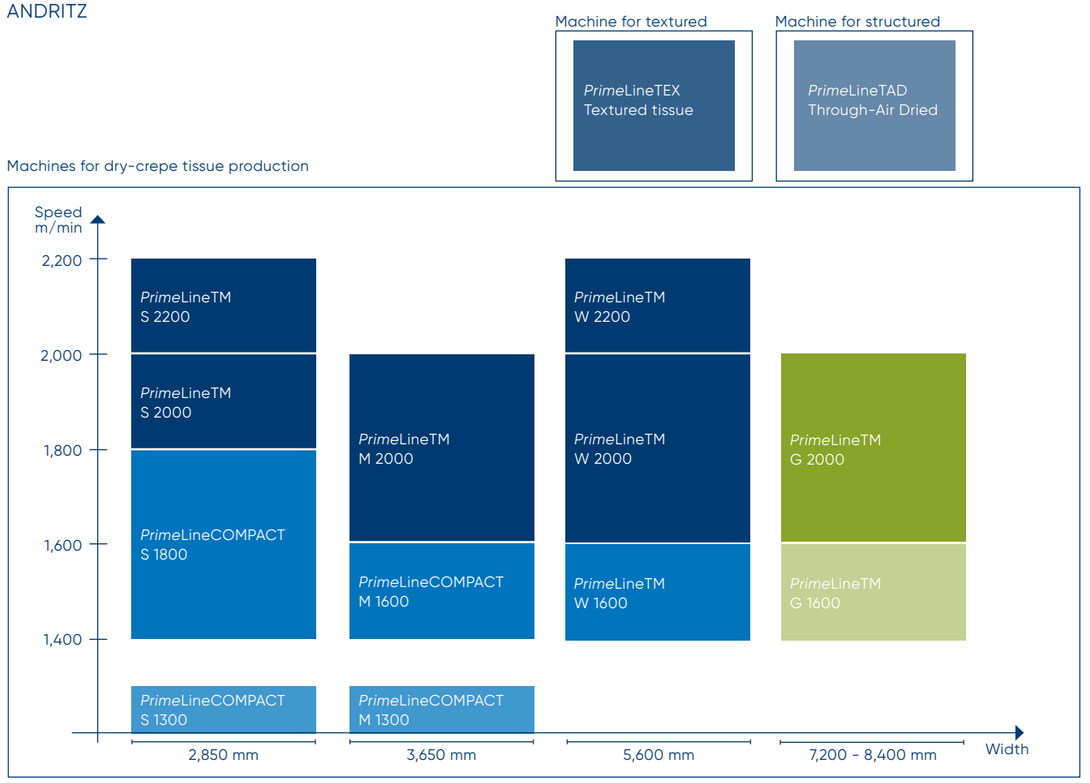
“We serve the industry with a complete product range from dry-crepe to textured and structured tissue.”

GÜNTER OFFENBACHER
Director Sales Tissue
ANDRITZ

FOCUS ON RESOURCE SAVINGS
All ANDRITZ key components, like the *Prime*Press XT Evo shoe press, *Prime*Dry Steel Yankee, *Prime*Dry YES steam generator (Yankee Eco Steam system), *Pri*meDry Heat Recovery system, and *Prime*Dry Hood, which can be operated with a gas or steam heating system or as a suction hood, are well proven.

Our scope is complemented by ANDRITZ fabrics and rolls for sustainable production and ANDRITZ pumps for cost-efficient dewatering.

24-HOUR SUPPORT
In addition, the machines can be connected to the Metris Performance Center to enable remote assistance, from commissioning to the start-up phase, as well as continuous optimization of the production process.



The compact one: *Prime*LineCOMPACT tissue machine

The *Prime*LineCOMPACT tissue machine design consists of standardized and easy-to-scale modules that lead to a much shorter payback time and an improved ROI compared to market solutions.

COMPACT MACHINE DESIGN

The ShortFlow stock preparation system minimizes chest volumes. Working together with a special blending system, grade changes in the stock preparation system are conveyed to the machine very quickly. The approach flow DD (Double Dilution) reduces investment and operating costs.

The headbox has a one-layer design. The step diffuser turbulence block enables high-quality formation as well as excellent CD profiles thanks to precise manufacturing.

The CrescentFormer has a very high dewatering capacity. The press section consists of a single suction press or the *Prime*Press XT Evo shoe press (for the *Prime*LineCOMPACT S 1800 and *Prime*LineCOMPACT M 1600) to achieve higher post-press dryness and to reduce drying energy consumption. Apart from this operating mode for dryness, the operating mode of the shoe press can also be adjusted to optimize the product quality features, such as bulk and softness.

The *Prime*Dry Steel Yankee enables excellent drying rates at low specific costs. Its high performance can be used to increase production or to save energy.

An extensive FE analysis showing the results of stress and elongation is used in designing the hood. The optimized nozzle geometry and air flows of the hood, together with the internally grooved Yankee, result in uniform and high-efficiency drying performance. A steam hood is also available.

The sheet run to the reel is supplied with sheet transfer support equipment as well as a highly efficient dust removal system.

The reel is controlled pneumatically and includes linear primary arms and pivoting secondary arms. A nip load compensation system in the secondary arm ensures even winding pressure. Load relief during the transfer process, together with precise electronic controls, provides consistently high tissue quality all the way to the reel. The required consistent and stable operation is achieved with a special control philosophy which is implemented in the *Prime*Control Automation system.

ShortFlow stock preparation and approach system with double dilution

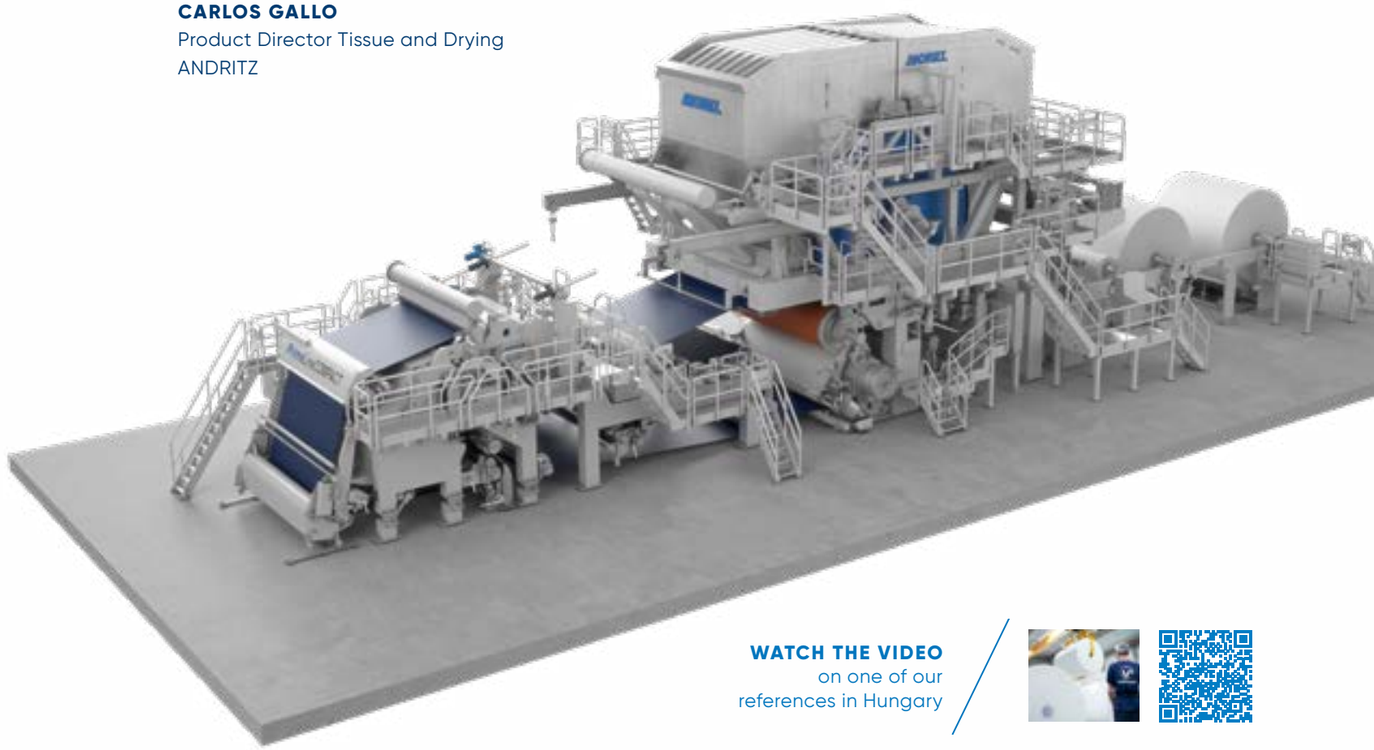
MACHINE TYPES

*Prime*LineCOMPACT	S 1300	S 1800	M 1300	M 1600
Design speed	1,300 m/min	1,800 m/min	1,300 m/min	1,600 m/min
Width at reel	2,850 mm	2,850 mm	3,600 mm	3,600 mm
Maximum gross production 1)	63 t/d	110 t/d	80 t/d	125 t/d
Furnish	Virging pulp / DIP			
Paper grades	Tissue and towel			
Press concept	Single	Single / Shoe / Double	Single	Single / Shoe / Double
Yankee diameter	12 / 15 ft.	12 / 16 / 18 ft.	12 / 15 ft.	12 / 16 / 18 ft.
Hood heating	Gas / Steam / Combo / Suction hood			

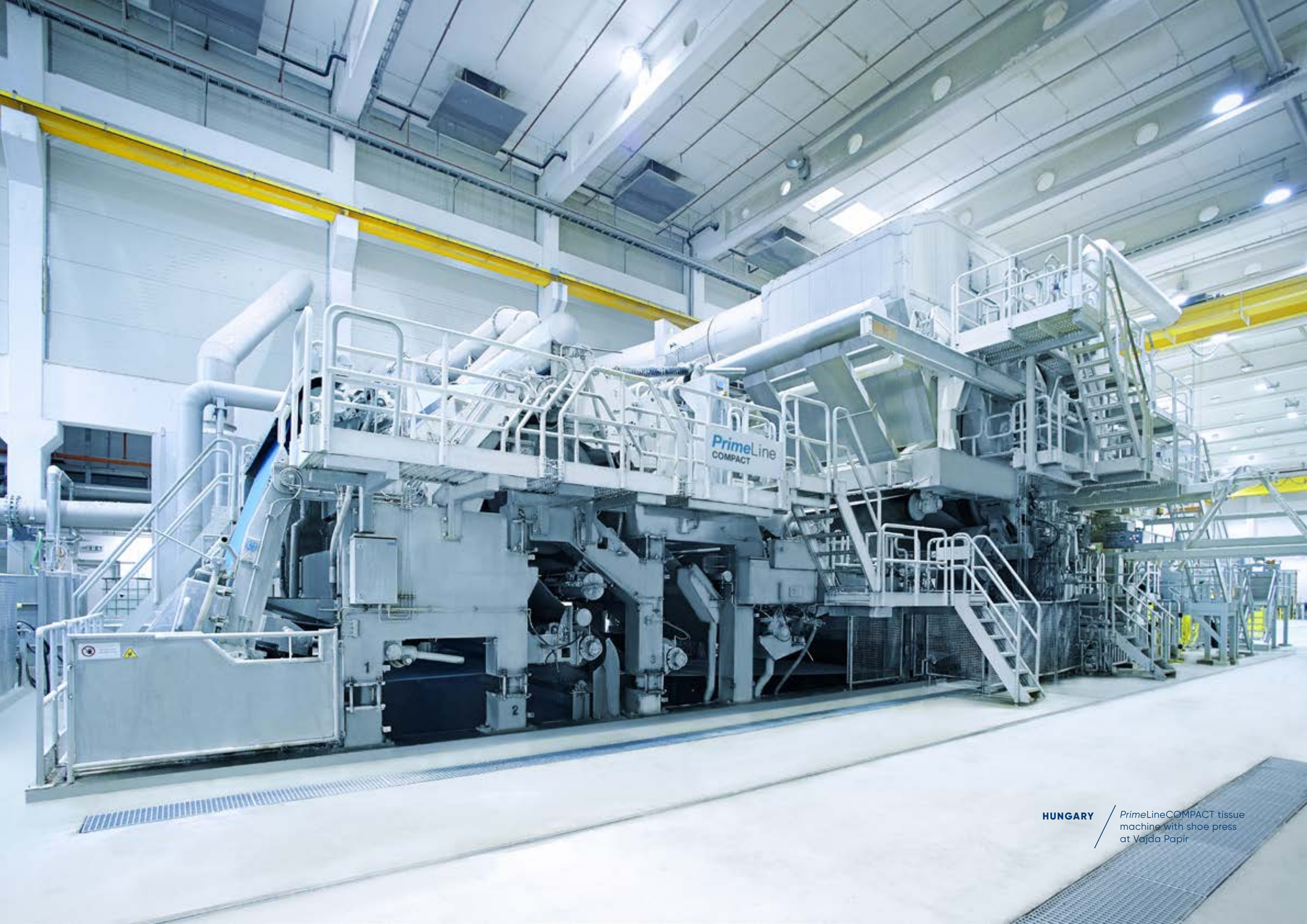
1) Typical production data. Actual capacity depending on tissue grades, furnish, and type of press and drying section.

"The *Prime*LineCOMPACT addresses newcomers in the tissue business and customers looking for solutions with a very short payback time."

CARLOS GALLO
Product Director Tissue and Drying
ANDRITZ



WATCH THE VIDEO
on one of our references in Hungary



HUNGARY / *Prime*LineCOMPACT tissue machine with shoe press at Vajda Papír

JAPAN

The twins: two *Prime*LineCOMPACT tissue machines at Shin-Ei Paper

The fast one: *Prime*LineTM tissue machine

*Prime*LineTM machines are widely embraced by the global tissue industry – not only due to their proven performance, but also for their innovations and speeds of up to 2,200 m/min. Each component in the *Prime*Line family has its unique strengths. Combined, they create a world-class machine in every way.

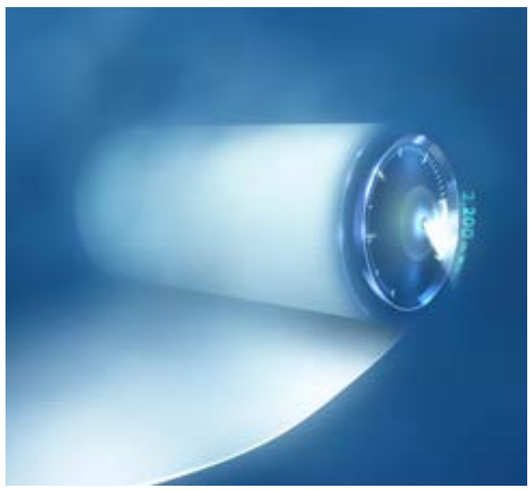
As in many energy-intensive industries these days, the tissue paper industry is facing increasing pressure to keep up with competitors as well as complying with upcoming statutory requirements to reduce energy consumption. With the latest technologies, which are innovative, efficient, and minimize consumption of resources, ANDRITZ can make an important contribution towards your tissue production line improvements, but this without compromising on product quality.

HIGH CAPACITY AND RESOURCE SAVINGS

Apart from high speeds, resulting in high capacities, the *Prime*LineTM machines focus on resource savings. As in the *Prime*LineCOMPACT machines energy-efficient key components can be installed. Here is a selection of these components.

*Prime*ProFiler dilution control

This tailor-made dilution profiling solution, with all major components made of stainless steel, enables best possible basis weight profiles at optimized conditions.



*Prime*Press XT Evo shoe press

Our shoe press for tissue machines allows you to boost the paper quality and/or the post-press dryness, meaning higher production capacity and lower energy consumption or fiber savings compared to conventional systems.

*Prime*Dry Steel Yankee

The performance of an ANDRITZ steel Yankee exceeds that of a cast-iron Yankee of the same size. Steel Yankees have an evaporation rate that is 15-20% higher than cast-iron models, which results in 8-10% better machine performance.

*Prime*Dry Head Insulation

Tissue machine Yankees show significant heat losses at the head. Here, the savings potential in terms of steam consumption, is 2-5%. Head insulation is not just for new Yankees, but can also be retrofitted to existing units.

*Prime*DustEXT dust control

The multi-box system for machine dust control does not interfere with the sheet or impede access to the machine. The design of the boxes prevents plugging and ensures constant suction for efficient dust removal.

*Prime*Dry YES Yankee Eco Steam system

This system returns a large part of the energy to the production process by using waste heat to evaporate condensate. This condensate is then fed to the Yankee in the form of steam. Up to 30% steam savings are thus possible.

With a design speed of 2,200 m/min, the *Prime*LineTM S 2200 and *Prime*LineTM W 2200 number among the fastest tissue machines worldwide.

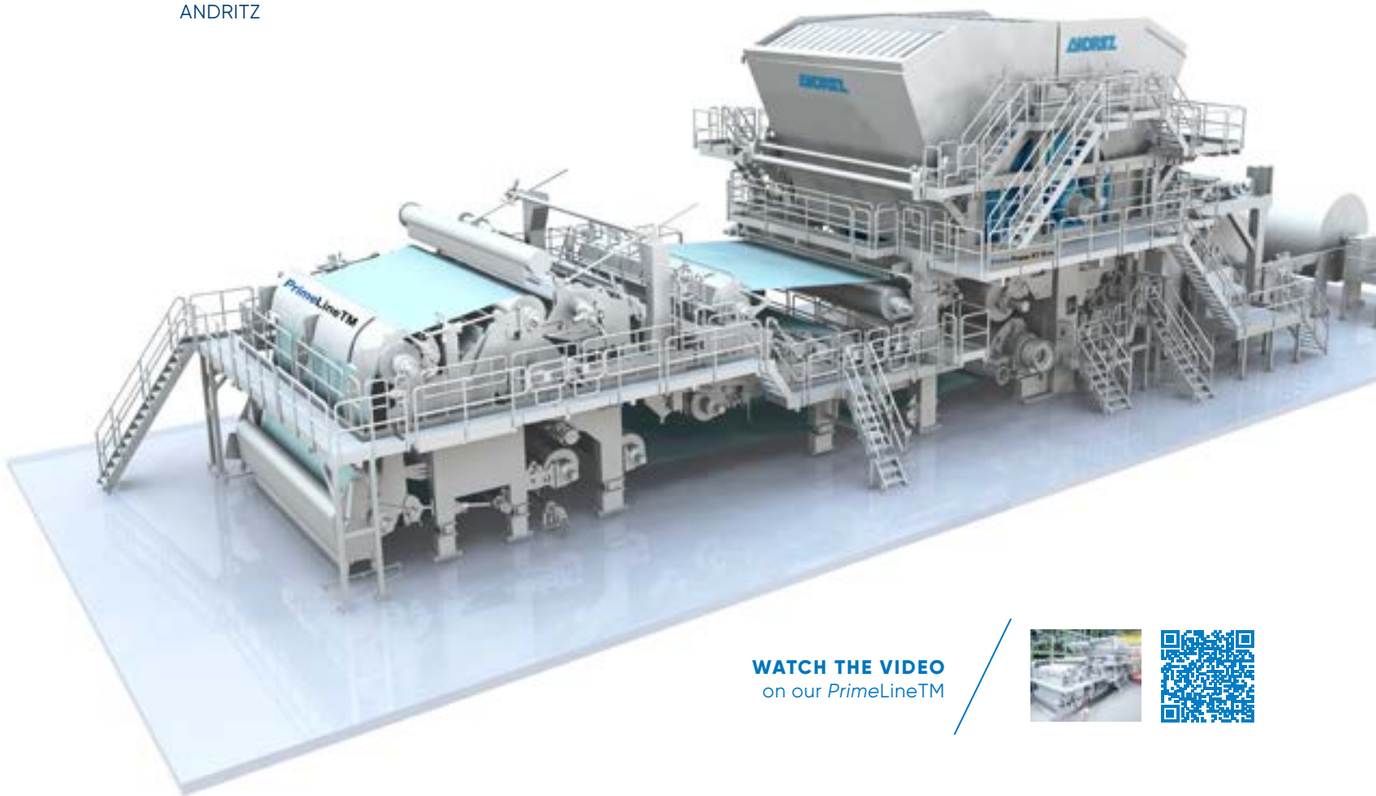
MACHINE TYPES

*Prime*LineTM	S 2000	S 2200	M 2000	W 2000	W 2200
Design speed	2,000 m/min	2,200 m/min	2,000 m/min	2,000 m/min	2,200 m/min
Width at reel	2,850 mm	2,850 mm	3,600 mm	5600 mm	5600 mm
Maximum gross production 1)	140 t/d	140 t/d	180 t/d	280 t/d	280 t/d
Furnish	Virgin pulp / DIP				
Paper grades	Tissue and towel				
Press concept	Single / Shoe / Double				
Yankee diameter	16 / 18 / 22 ft.				
Hood heating	Gas / Steam / Combo hood				

1) Typical production data. Actual capacity depending on tissue grades, furnish, and type of press and drying section.

"The *Prime*LineTM machines with design speeds of up to 2,200 m/min number among the fastest worldwide."

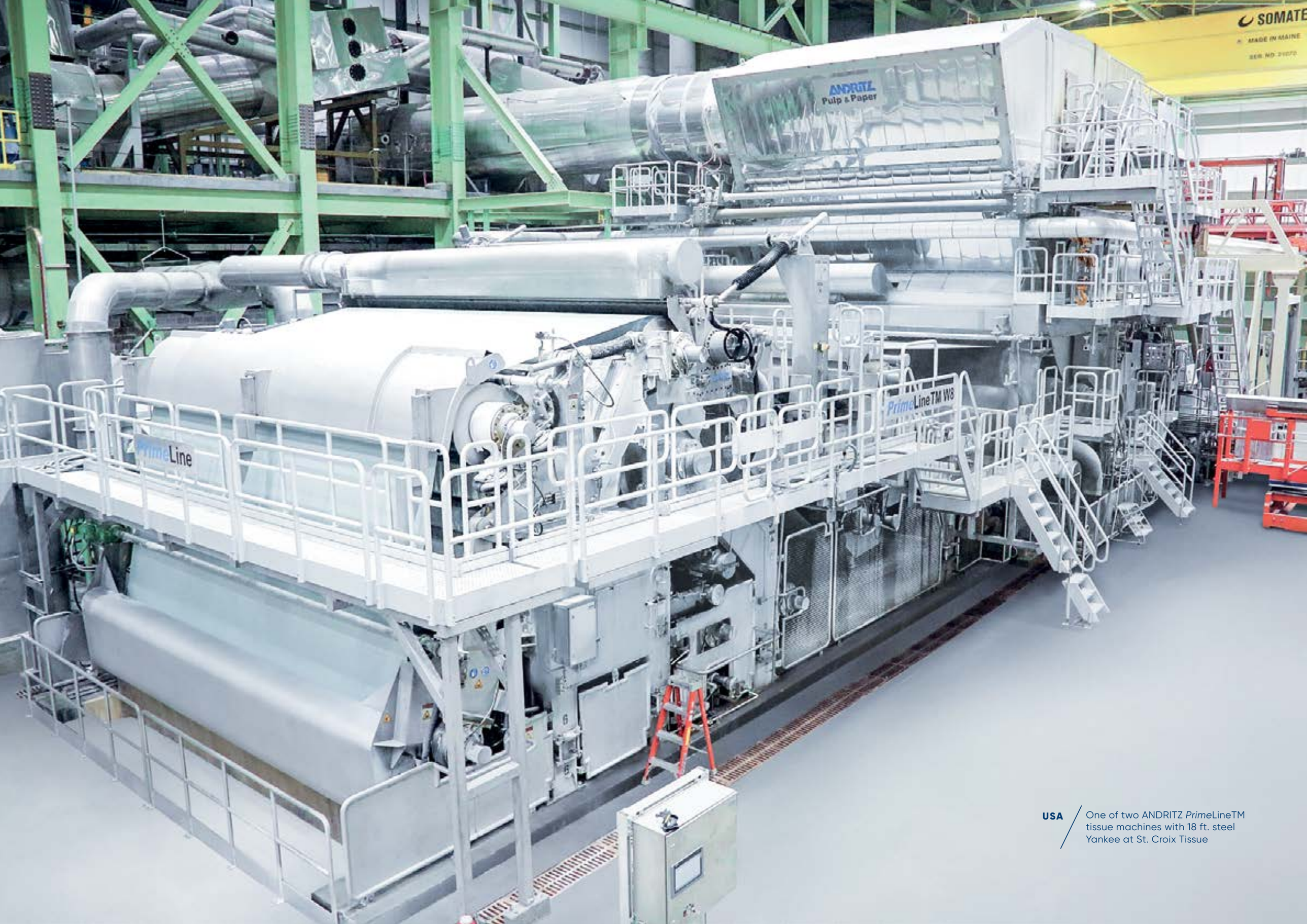
FRANZ HARRER
Head of Technology Tissue
ANDRITZ



WATCH THE VIDEO
on our *Prime*LineTM

RUSSIA

*Prime*LineTM tissue machine with shoe press at Arkhbum Tissue



USA One of two ANDRITZ *Prime*LineTM tissue machines with 18 ft. steel Yankee at St. Croix Tissue

The flexible one: *Prime*LineTEX tissue machine

The main goals behind the *Prime*LineTEX are to offer a competitive tissue machine for premium grades that delivers a tissue quality close to structured (TAD) tissue but with substantially lower fiber input (versus dry-crepe) and less energy consumption (versus TAD).

UTMOST FLEXIBILITY

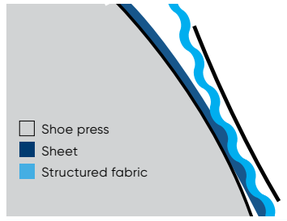
The *Prime*LineTEX can be operated either in textured mode or in dry-crepe mode. The rebuild time from one mode to another is less than one day.

FIBER SAVINGS OF UP TO 25%

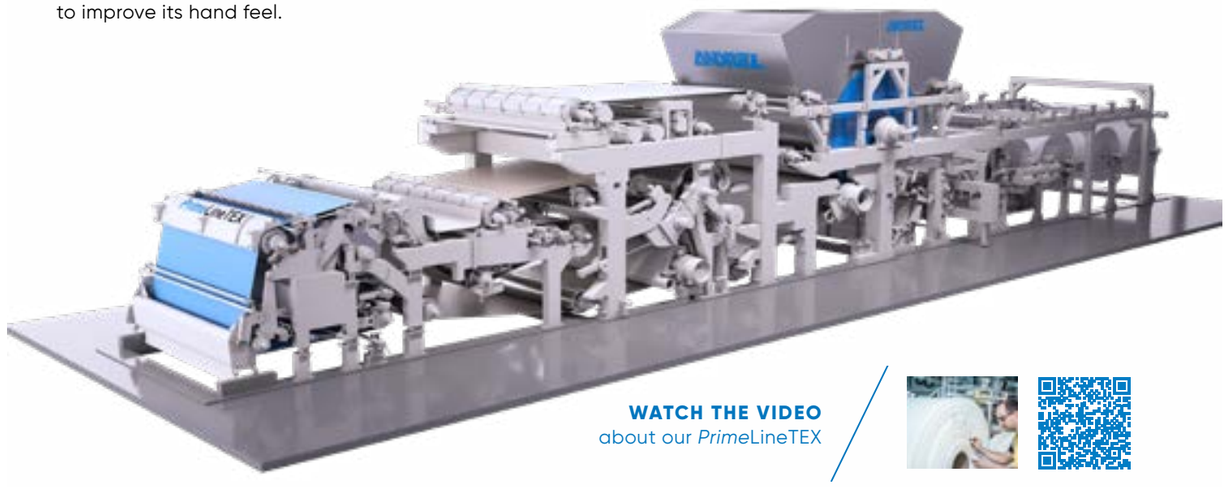
The *Prime*LineTEX requires up to 25% less fibers. In a comparison between 3-ply textured tissue from ANDRITZ and other 3-ply premium toilet tissue produced in Europe, fiber savings of up to 12% have been seen so far. If we compare the fiber input for ANDRITZ tissue with the amount of fibers required for European 4-ply premium toilet tissue, it is even possible to achieve up to 25% fiber savings.

MACHINE DESIGN

The machine features a very compact design with a conventional headbox and CrescentFormer. Here, a flat paper sheet is formed between a forming fabric and felt. It is followed by the TEX module, where the sheet is pressed mechanically and the dryness is increased substantially. Then the sheet is transferred to a structured fabric and moulded using rush transfer and a moulding box. The sheet is carried on the structured fabric and transferred to the Yankee surface, where it is fully dried with assistance from the hood. Before proceeding to the reeling area, the sheet can pass through a calender to improve its hand feel.



RUSH TRANSFER
The sheet is transferred to a structured fabric with a speed difference (5-10%) between the fabric (slow) and the shoe press (fast) so that the sheet takes on the structure.



WATCH THE VIDEO
about our *Prime*LineTEX

The premium one: *Prime*LineTAD tissue machine

Premium-quality tissue and towels are the standards by which many markets are being defined. The improved softness, absorbency, and bulk generated by the Through-Air Drying (TAD) process give these products superiority over conventional processes.

PREMIUM GRADES

*Prime*LineTAD machines enable the production of a "structured" sheet with improved bulk, absorbency, and softness while retaining adequate strength properties.

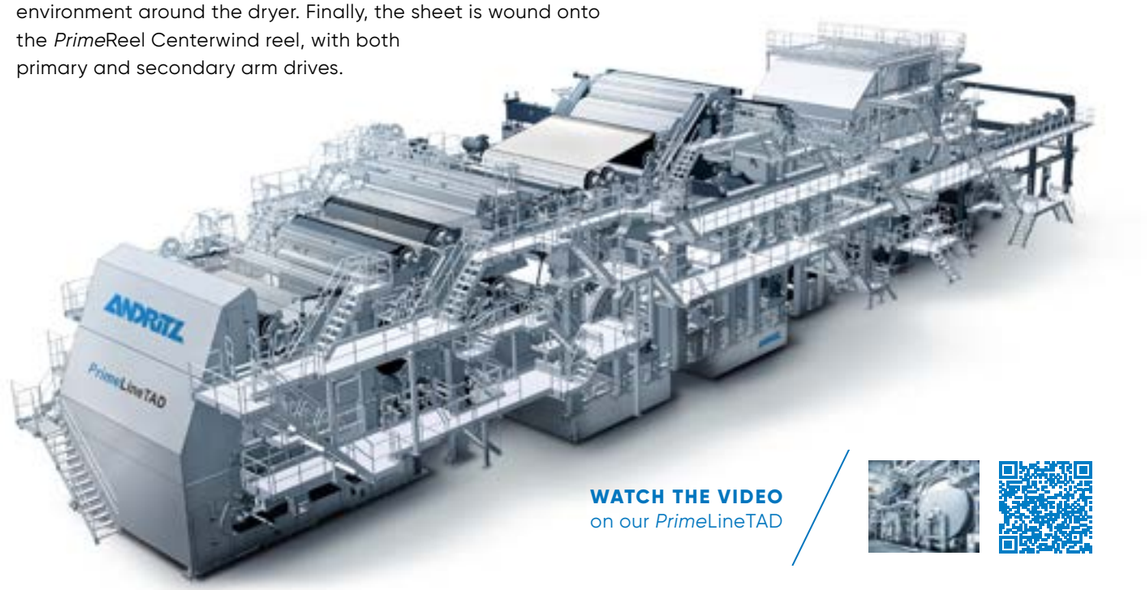
FIBER AND ENERGY SAVINGS

If energy consumption is a major issue, we can assist by installing a co-generation plant for the new operation. This enables the waste heat from the gas turbine generator exhaust to be used as the primary energy source for the drying system, giving a much better energy balance than otherwise achievable. Alternatively, in markets where gas is not available or steam is abundant or cheap, a steam/air heat exchanger can be used to heat the process air.

MACHINE DESIGN

A typical ANDRITZ TAD machine consists of the *Prime*Flow headbox, with dilution profiling system, together with a C-wrap twin wire former. The heart of the process is the newly designed TAD drum, a welded construction made entirely of stainless steel. The two TAD drums are followed by a steel Yankee and vapour capture hood to regulate the environment around the dryer. Finally, the sheet is wound onto the *Prime*Reel Centerwind reel, with both primary and secondary arm drives.

TAD DRUMS
Among the core elements are the TAD drums that are made entirely of stainless steel, thus providing energy-efficient drying while preserving bulk.



WATCH THE VIDEO
on our *Prime*LineTAD

AUSTRIA / Textured tissue production at the ANDRITZ tissue pilot plant in Austria

The pilot plant: *Prime*LineTIAC

*Prime*LineTIAC, Tissue Innovation and Application Center, located at the ANDRITZ headquarters in Graz, Austria, is the world's most modern tissue pilot plant, enabling customers, suppliers, and R&D institutes to test and develop the tissue solutions of tomorrow.

RUN TRIALS ON INDUSTRIAL SCALE

The Tissue Innovation and Application Center comprises a complete, state-of-the-art tissue production line, including laboratory facilities for tests and trials to develop new products and processes in the tissue sector. It is available to tissue producers and suppliers, research and development companies, and universities. Thus, customers and developers can conduct tests and trials under many different conditions, for example to optimize fibers for a specific product, improve product qualities, increase dryness, and reduce energy consumption. The impact of variables such as stock preparation, chemicals, vacuum, machine clothing, pressing, and drying with hot air and steam can all be measured and evaluated accurately.

NETWORKING

To run the trials in a highly professional and confidential environment, ANDRITZ experts from R&D, the stock preparation, machine design and engineering, automation, and pumps departments are available for collaboration and discussions. Customers can also bring along their own team of specialists.

STOCK PREPARATION

The *Prime*LineTIAC has its own complete stock preparation line together with the approach flow system. Many different kinds of pulp can be processed in one production line, which is split into a separate short fiber and a long fiber line. In addition, all units are available in small industrial scale, creating an excellent environment for best possible fiber treatment and tests according to the individual needs of customers and products.

TISSUE MACHINE

The tissue production line offers utmost flexibility for the production of conventional, textured, and structured (TAD) tissue. It features various configurations that are also available on the market as single-machine concepts. This means customers can run extensive trials with what could potentially be their future machine configuration. The machine can be operated with either a suction press roll or a shoe press, a regular CrescentFormer, and with a 16 ft. steel Yankee or two 14 ft. TAD drums.

AUTOMATION

The Metris *Prime*Control E automation hardware and software developed by ANDRITZ provides utmost flexibility in monitoring and controlling the various machine configurations as well as the stock preparation system, including alarm management, online documentation, and eco-monitoring for example.

Our stock preparation, tissue machine, and hydraulic laboratories feature a broad range of state-of-the-art measuring devices and optimally conditioned rooms for analysis and evaluations.

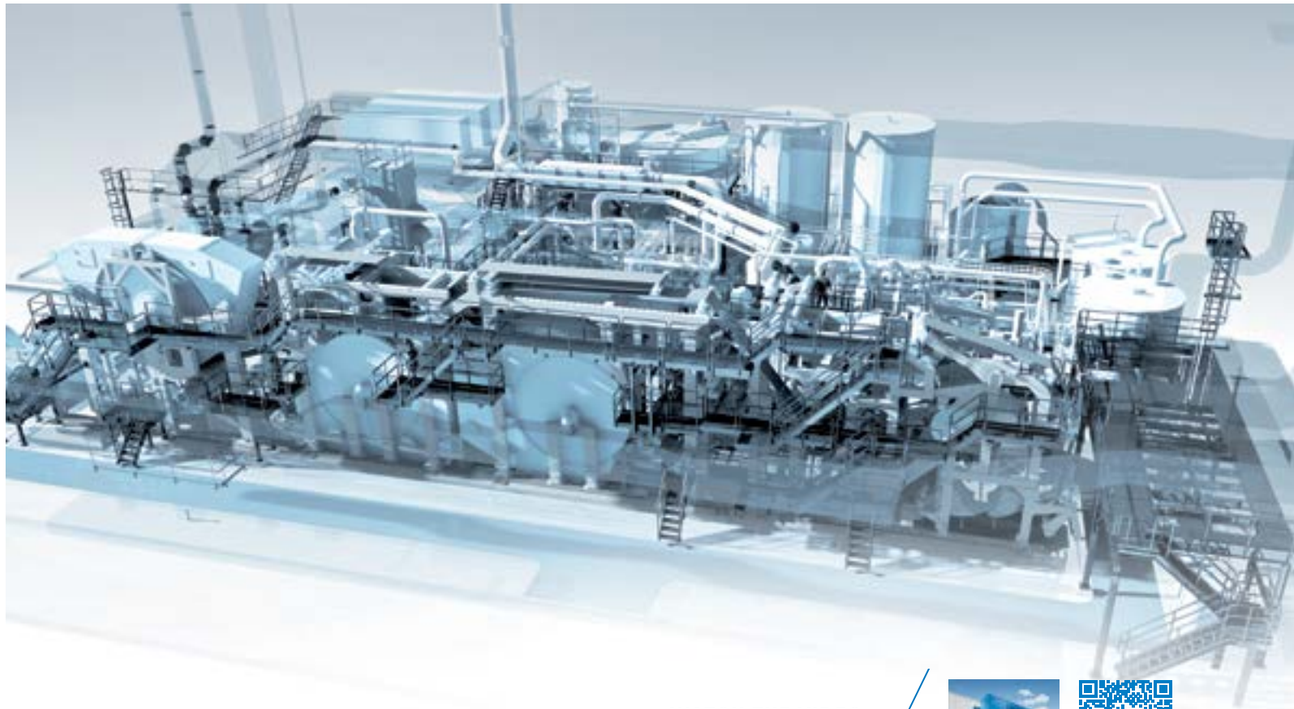
TISSUE MACHINE

Paper grades	Tissue from 10 to 50 g/m²
Former concept	CrescentFormer, TwinWire former
Yankee speed	600 to 2,500 m/min
Reel speed	500 to 2,000 m/min
Sheet width	600 mm
Pilot configurations	Dry-crepe, textured, structured

- Headbox: Configurations with 1, 2 and 3 layers
- Former: CrescentFormer, TwinWire former
- Pre-dryer: Two TAD drums, 14 ft.
- Hood: TAD hood
- Press: Suction press, shoe press
- Dryer: Steel Yankee, 16 ft.
- Hood: High-temperature, 500°C
- Sheet run: Passive/active foils
- Reel: Centerwind reel

"I am looking forward to welcoming you to the *Prime*LineTIAC to implement the tissue solutions of tomorrow."

STEFANO MARENCO
Technical Director *Prime*LineTIAC
ANDRITZ



WATCH THE VIDEO
on our *Prime*LineTIAC

AUSTRIA

*Prime*LineTIAC
Tissue Innovation and
Application Center

DISCOVER OUR FULL-RANGE PORTFOLIO FROM FIBER PROCESSING TO PAPERMAKING

An outstanding paper product requires outstanding production – matched with the particular needs of raw material and final product. Discover the full-range portfolio from ANDRITZ: Excellent stock preparation that allows best fiber development according to furnish and with economical use of resources. *Prime*Line paper machines that are a synonym for producing top-quality tissue, paper, and board grades. Complete lines or single units, upgrades, and modernizations. Contact us and benefit from your individual package in papermaking technology.

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GET AN OVERVIEW
on our tissue
technologies and services