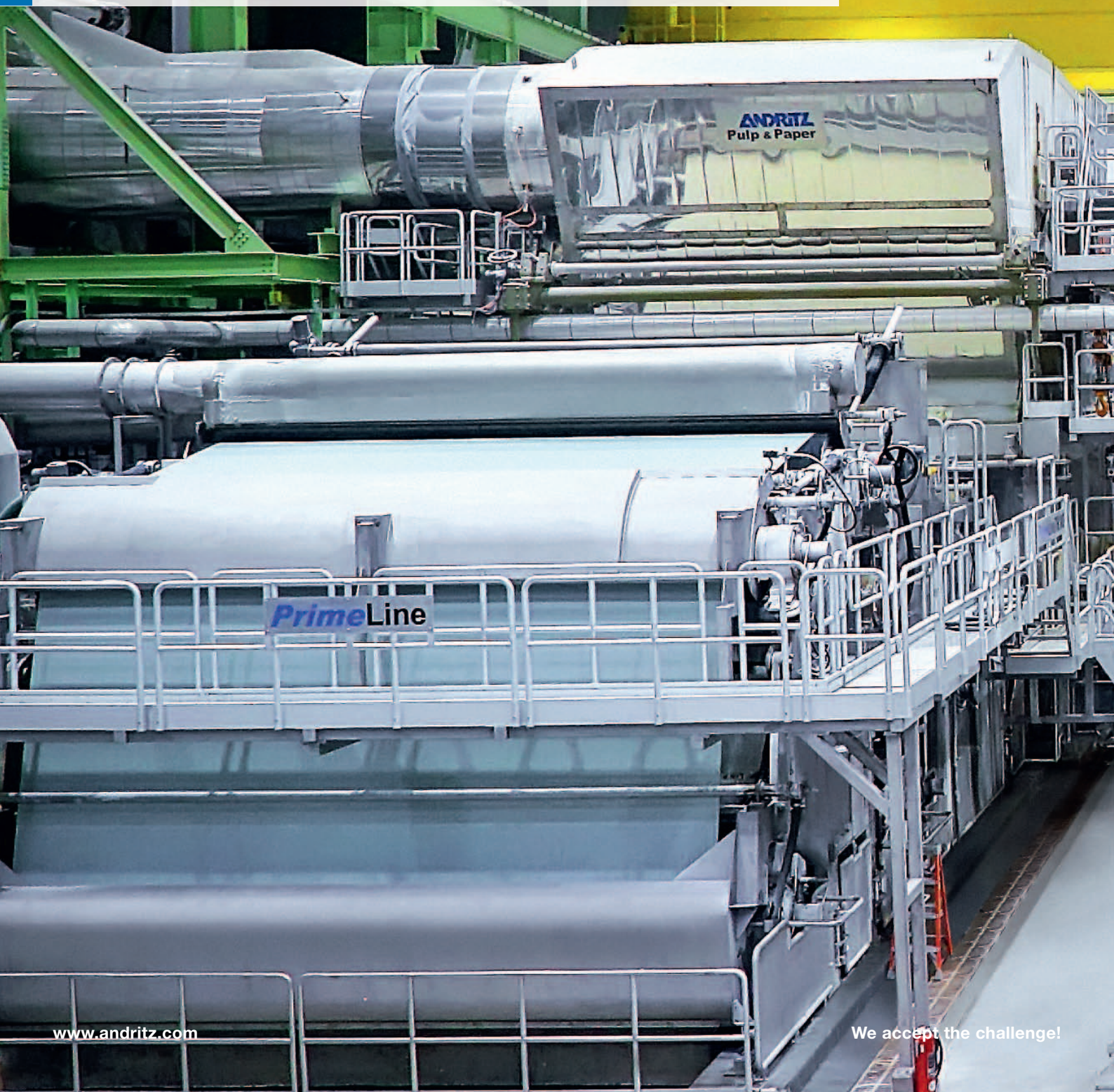


Mill story

St. Croix Tissue,
Baileyville TM1 and TM2, USA



Gathering impressions

Baileyville, Washington County, Maine

Baileyville is a small town located in Washington County, Maine, and was originally settled by Quakers in 1780.

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▲ The St. Croix Valley is rich in water. The Baileyville aquifer can produce 3,000 gallons/minute of clean, fresh water. © Downeast Economic Development

Maine and Washington County

The state of Maine was originally part of the Commonwealth of Massachusetts. Maine voted to secede from Massachusetts to become the 23rd state on March 15, 1820. Washington County is located in the north-eastern part of Maine and it is also part of the “Downeast” region. The “Downeast” term originally came from sailors describing the direction of the prevailing winds that pushed sailing ships “downwind” and to the “east” as they carried their cargo up the coast from Boston and other east coast ports to this part of Maine. The “Downeast” term later expanded to define this region’s culture, which is based on its strong maritime background and influenced by the rugged ocean coastline, small towns, rural life, and harsh weather that can come and go in this part of upper Maine.

Washington County was named for George Washington. It is also known as the “Sunrise County” because it includes the

easternmost point of land in the continental United States, which is West Quoddy Head in Quoddy Head State Park, Lubec, Maine. The famous red and white striped West Quoddy Head lighthouse sits here overlooking the Quoddy Narrows. The Quoddy Narrows is the strait between Lubec, Maine and Campobello Island, Canada, and provides access to Passamaquoddy Bay and to harbors located on the St. Croix River. Campobello Island is a small Canadian Island in the Bay of Fundy that was the summer home of President Franklin D. Roosevelt and his family for over 50 years. The Bay of Fundy has the highest tide swings in world, which measure a water level height change over 18 feet (5.5 meters) twice a day. The St. Croix River height is impacted by this tidal fluctuation as much as 15 miles inland from the sea.

The St. Croix River

The St. Croix River was an early trade corridor to interior Maine and New Brunswick



▲ The St. Croix River forms part of the Canada–United States border between Maine (USA) and New Brunswick (Canada). © Flickr.

from the Atlantic coast. Ocean ships could navigate upstream to Calais and St. Stephen. In time, the tidal fluctuation made Eastport a preferred port for deeper draft vessels. The river upstream of Calais and St. Stephen became an important transportation corridor for log driving to bring logs for lumber and pulpwood from the interior forests to the saw mills and paper mills built to use water power at Calais and Woodland.



▲ The St. Croix Valley is rich in wild blueberries, cranberries, and pine. © Tracey Webber

The St. Croix Valley

The region around the St. Croix River is rich in agriculture. The main focus lies on berries and hard cider production to create value-added products for the region.

From Woodland to Baileyville

Woodland was originally the name of the entire town of Baileyville until the 1990s. Besides Woodland of Washington County, there was also Woodland of Aroostock County. According to the laws of Maine, two towns are not allowed to share the same name. Because Woodland of Aroostock County was founded as a township first, the state court allowed it to keep its name and Woodland of Washington County was ordered to choose a new name: “Baileyville”. Woodland is now just a census-designated place in the town of Baileyville.

Baileyville — key facts:

- Inhabitants: approx. 1,500
- Size: 41.91 sq mi (108.5 km²)
- Main industries:
pulp and paper production,
logistic services

Baileyville

Baileyville is a small and growing town that offers a relaxed way of life surrounded by beautiful nature that includes the nearby Moosehorn National Wildlife Refuge. Baileyville is also well positioned to support businesses and industries with the St. Croix River and nearby Eastport ME Seaport for water transportation; being close to three main bridges going to Canada for trucking transportation; a local municipal airport that can handle small jets for air transportation; and having rail service to Canada that is available in conjunction with St. Croix Tissue and Woodland Pulp.

St. Croix Tissue

The strong newcomer in US tissue business

Two decades ago, the Woodland mill in Maine was a vibrant pulp and paper complex. Suffering the fate of many commodity pulp and fine paper mills, Woodland was near extinction in 2010 when a company with a vision bought the assets, injected USD 200 million (EUR 170 million), and changed the course to value-added tissue production.

St. Croix Tissue is among the newest producers of premium tissue parent rolls in North America. The machine hall is built next to the existing hardwood pulp mill Woodland Pulp. Mirror-image ANDRITZ PrimeLine tissue machines, which started up in 2016, are quickly ramping up to a combined design production of 126,000 t/a.

“Without question, the addition of tissue making capabilities saved this pulp mill,” says Arvind K. Agarwal, CEO of International

Grand Investment Corp. (IGIC), the parent company of Woodland Pulp, St. Croix Tissue, and Cascade Pacific Pulp mill in Halsey, Oregon. “Just prior to our buying Woodland in 2010, the owner (Domtar) put the mill into indefinite shutdown.”

The future of this facility as a commodity pulp mill was simply not sustainable.”

Arvind K. Agarwal
CEO, International Grand Investment Corp.



◀ St. Croix's Marco L'Italien, Vice President (left) with Marty Richard, Tissue Manager



Rebirth

The rebirth of the mill has special meaning to Marty Richard, Tissue Manager. Richard was raised in the local community and worked at the mill for 16 years. “We saw some tough times and it looked like the end was near,” Richard says. “In the late 1980s, there were 1,200 people working in the pulp, paper, and OSB (oriented strand board) plants around here.

Before IGIC came in there were about 320 people in the pulp mill left. To come full circle where we are investing and hiring – for a mill that has a bright future – is really rewarding to be part of.”

Setting the stage

“When we acquired Woodland in 2010, we already had the idea to maximize our return by adding tissue making capacity,” says Agarwal. “My job was to turn this facility

around by converting it from a commodity producer to a value-added facility.”

Agarwal and his team went to work immediately. “First thing,” Agarwal says, “was to reduce our dependence on oil by bringing natural gas to the mill. Local distribution companies said it would take several years to permit and build a pipeline. We did it in 10 months with an investment of USD 17 million. That was a positive indicator to the employees and community that we meant business.”

“There were also investments to improve the reliability and throughput of the kraft mill,” says Marco L'Italien, Vice President. These investments set the stage for the announcement in 2013 that a new tissue mill would be built.

◀ St. Croix Tissue produces 88-inch (2,235 mm) diameter rolls.

Woodland pulp mill



The affiliate company of St. Croix Tissue, Woodland Pulp, is located next to it along the St. Croix River. Both companies together form the largest employer in Washington County, with approximately 320 jobs. The mills were founded in 1904 as St. Croix Paper Co. and began operating in Baileyville two years later.

Premium pulp

Today, the Woodland Pulp mill produces St. Croix Hardwood, a premium Northern ECF bleached Kraft pulp manufactured using hardwood chips from Maine and New Brunswick, Canada. The pulp is sold to paper makers all over the world and approximately one-third of the pulp is used by St. Croix Tissue.

Green production

Woodland pulp has a strong history of environment stewardship. Over the years, it has reduced its environmental footprint and continues to support responsible forestry management to ensure environmental sustainability for generations to come. The owners have made significant capital investments in environmental controls for air, wastewater, and solid waste compliance.

Woodland pulp is 100% energy self-sufficient and has state-of-the-art air pollution control equipment.

High-capacity twins

Two tissue machines with 2,000 m/min speed

Proven supplier

According to Tom Dorsch, Project Leader for St. Croix, "We went through a very detailed process to develop the specs for this mill, and ANDRITZ was able to fulfill all the requirements of our spec."

Of importance was a spec for a steel Yankee, instead of cast iron, because of the heat transfer advantages and safety factors. St. Croix specified 18-foot diameter Yankees instead of the standard 16-foot ones. "The larger Yankees were a good choice," L'Italien says. "We don't have nuisance breaks since we have eliminated the steambox and simplified the machine."

Another consideration was machine width. "To meet the needs of one of our key customers," Richard says, "we needed a

machine that would give us roll widths from the standard 102 inches (2,591 mm) up to 112 inches (2,845 mm). Not too many tissue manufacturers have this capability on-machine."

"We have come to appreciate ANDRITZ's contribution not only for their up-front engineering, but also for their understanding of the entire process," Agarwal says. "They have been an excellent partner the entire time – from the initial design to optimization of the mill. They have also kept in the forefront of technology, ahead of their competitors."

▼ Tom Dorsch, St. Croix Project Leader (left) with John Schamell, ANDRITZ's Vice President North America for tissue and drying, on TM2.



Building the vision

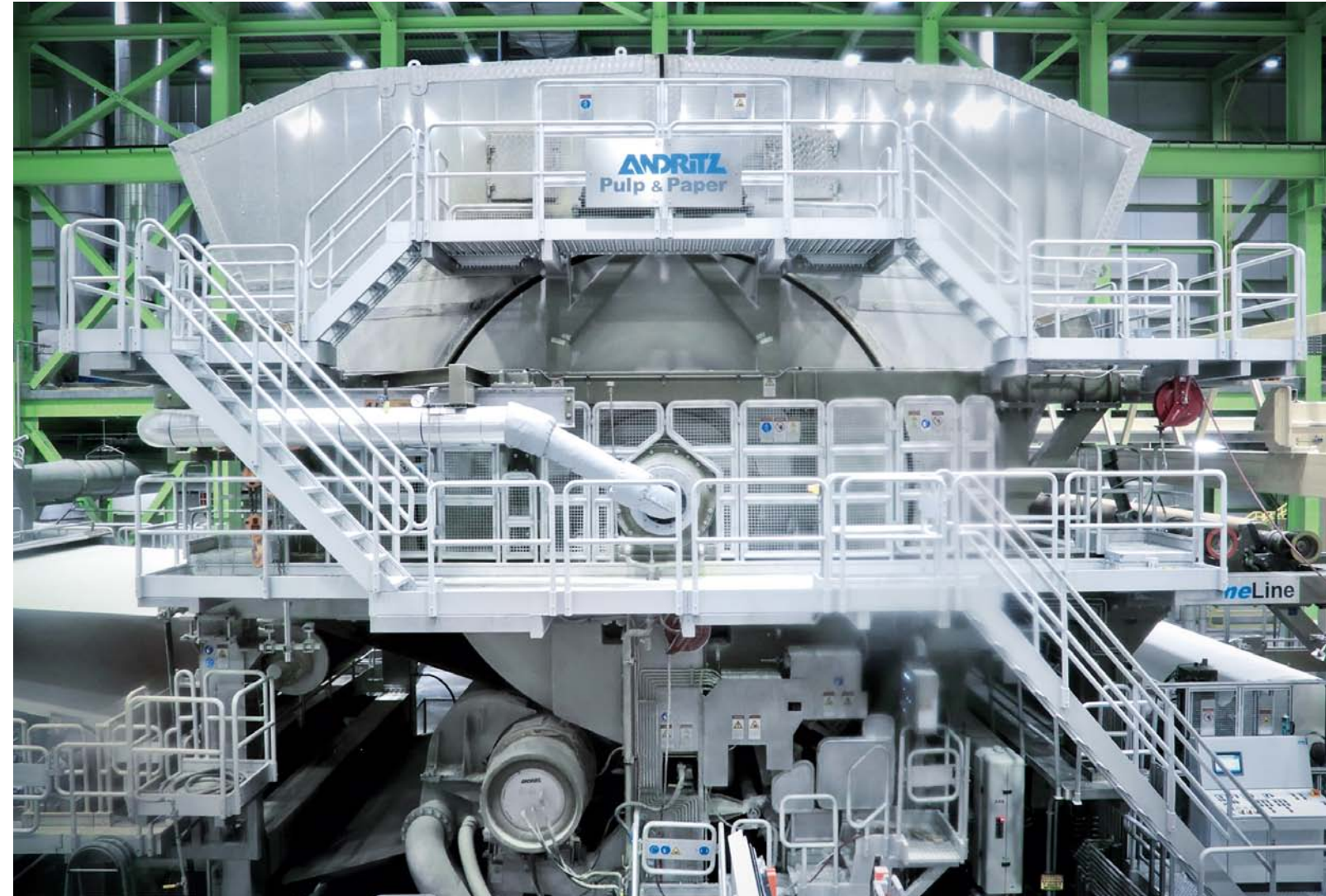
The contract with ANDRITZ was signed in January 2014. Groundbreaking for the new mill occurred in October 2014. "We had one of Maine's harshest winters," Dorsch recalls. "This at the time we were doing the deep foundation work. There were challenges to be sure, but all of the suppliers, including ANDRITZ, stepped up to help us recover schedule."

For the Baileyville area this was a massive construction project. "Logistics was one of our biggest challenges given our remote location," Dorsch says. "It is 35 miles to a deep water port, 90 miles to the closest airport, and highway access is by two-lane roads. We had over one million construction hours involving 525 people on-site at our peak in the middle of winter."

Successful start-ups

On the equipment side, ANDRITZ delivered the first machine in May and the second one in August 2015. "We began commissioning TM1 in January 2016," says John Schamell, ANDRITZ's North American Vice President for tissue and drying. "Even though construction was proceeding around us, we checked the machine out section by section. It was a little hectic and the operators were brand new. But, we got stock on the wire in early March."

The second machine was commissioned and started up with a more traditional approach and pace. "It started up well," says Schamell, "even though we had fewer resources since TM1 was in full operation by then, we had a good start-up in July 2016."



▲ St. Croix specified a large steel Yankee (18-foot diameter) for both machines. TM1 started up in March and TM2 in July 2016.



ANDRITZ Yankee service

ANDRITZ offers comprehensive Yankee service activities by focusing on the overall added value of the Yankee: from the calculation to manufacturing and coating, operation, and optimization.

Seeing the complete picture

The ANDRITZ Yankee service succeeds with lasting effect in improving your machine's efficiency as well as your Yankee's

performance. The service range is suitable for all types of Yankee, for tissue or paper machines, MG paper or tobacco, steel or cast Yankees, old or new, regardless of the OEM. The service package that ANDRITZ offers includes solutions and support for upgrades and replacements, safety issues, production, and analysis (e.g. on-the-run measurements).

PrimeLine™ W8
High-speed tissue machines with 5.6 m width



Happy producers, happy converters

Excellent product quality

The innovative technology concept of the two CrescentFormer tissue machines and the local training program really pay off.

“In our first full month of operation with both machines, we reached 70% of saleable design capacity for this mill,” Dorsch says. “I think that’s a pretty fast ramp-up.” When asked about the working relationship with ANDRITZ, Dorsch comments, “Whenever there were issues, ANDRITZ took ownership. Any problem got fixed and got fixed well. They were very open and transparent. They were always sensitive to timing, costs, and the impact on our operations. They are an excellent partner that way.”



▲ Operators in the control room for TM1 and TM2.

Multi-national machine

About 85% of the machine components were manufactured at ANDRITZ’s facility in Foshan, China. The steel Yankees were fabricated in ANDRITZ’s state-of-the-art workshop in Hungary. Headbox, press rolls, and hydraulic systems came from Europe and the air systems came from Canada. “Like many North Americans, I wondered what the quality of the components manufactured in China would be,” Richard says. “I went to the ANDRITZ workshop in Foshan to inspect the first machine. It was clear that quality was the first thing on the minds of the people – we didn’t even have to ask the question before management was explaining their QA/QC processes. It was impressive. After delivery, we could see that the workmanship was really excellent.”

Local training partnership

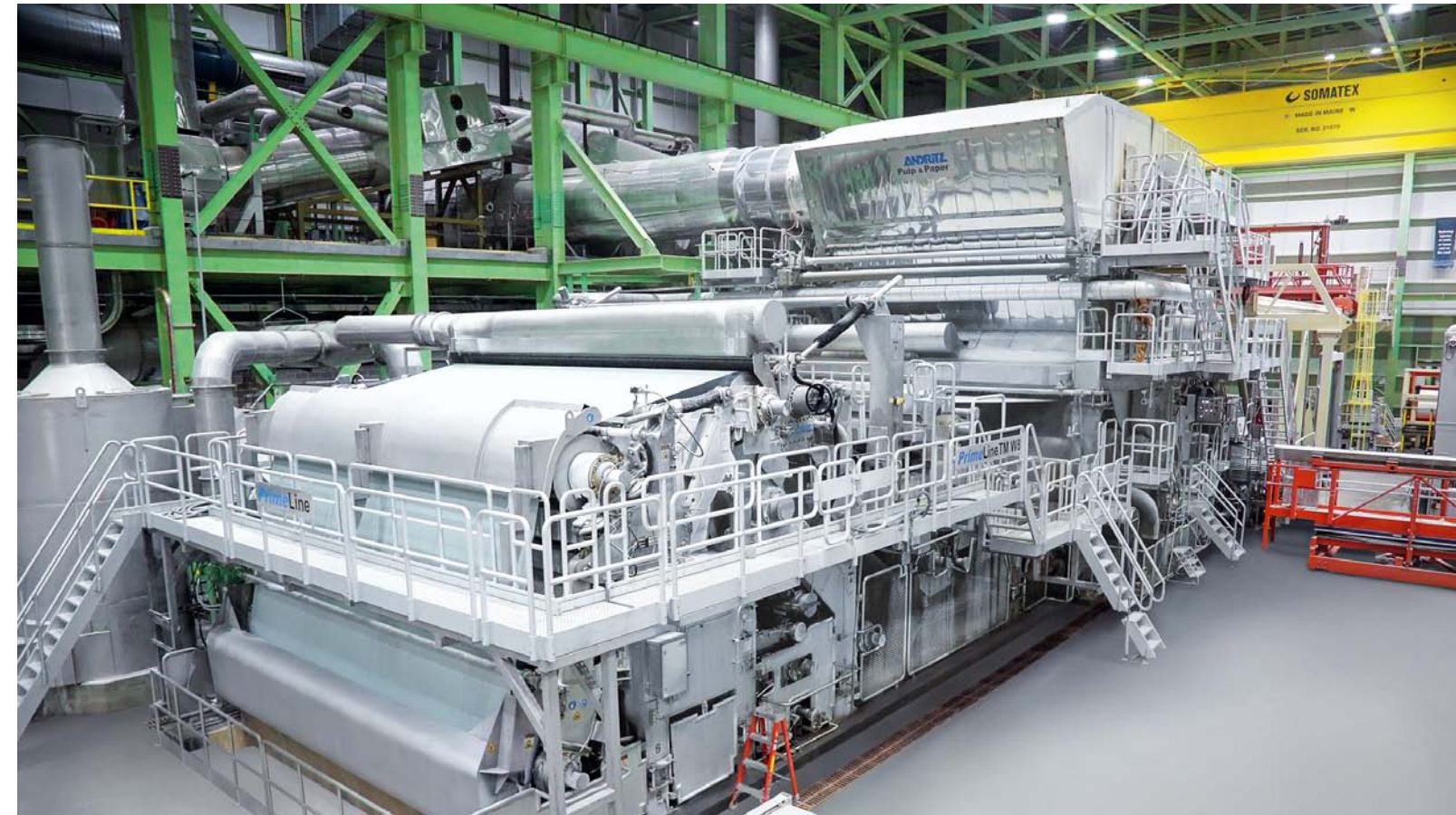
“ANDRITZ committed a very good team to this project, and they integrated well with our group,” Dorsch says. “This is the third machine-pair start-up I have worked on and I can say that this project had more vendor support than I have typically seen. But, it was essential here given that our

workforce was green with very little tissue experience.” St. Croix partnered with the local community college to design a training program so potential job candidates could learn something about tissue making. Completing the program did not guarantee a job, only the opportunity for an interview. “Then in August 2015 we hired the initial team of 58 employees,” Richard says. “The community college again partnered with us for a four-month training program. Much of this training was conducted by suppliers, including ANDRITZ.” Part of the funding for this project comes through a New Market tax credit program.

A requirement for that credit is that St. Croix hire 60% of its new employees from a low-income bracket and maintain that ratio for seven years. “This has a huge benefit for the community,” L’Italien says.

Excellent runability and smoothness

“Every converter, who has run our tissue, likes it,” L’Italien says. “One converter was able to raise speeds by 70% due to the runability of our product.” St. Croix considered investing in structured tissue, but decided to go with the CrescentFormer. “Even though our tissue is not structured, it is of very high quality,” Richard says. “In some cases, it has allowed us to get a foot in the door in traditional structured markets. The formation on the CrescentFormer is just so good that we can compete well in the softness for the higher end bath tissues.” “Before we started up, I was concerned about physical quality of the reels, since we would be making 88-inch (2,235 mm) diameter rolls,” L’Italien says. My concerns were unfounded. These machines make nice flat rolls with excellent profiles. Whatever ANDRITZ is doing with its reel building technology certainly is working.”



Prime production of tissue with innovative technology

There is increasing pressure for tissue producers to improve efficiencies and reduce consumption of energy. ANDRITZ has solutions which are innovative, efficient, and minimize the consumption of resources – without compromising product quality.

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, as well as advanced solutions to reduce overall energy con-

sumption form the basis of our offerings. PrimeLine tissue machines are available as PrimeLineCOMPACT, PrimeLineTM, and PrimeLineTAD tissue machines. Key components of these tissue machines are ideal for rebuilds and modernization projects.

Reduced energy consumption is the key! ANDRITZ offers the EconoFit control concept that monitors and analyzes the drying

process to reduce energy consumption. The PrimeDry steel Yankee (up to 22 ft. diameter) is made entirely of steel, resulting in greater safety and higher performance due to the elasticity of steel compared to cast iron. The higher performance can be used to save on energy costs by drying more with steam, which is generally relatively cheap.

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