FALL/WINTER 2013

Tissue360°

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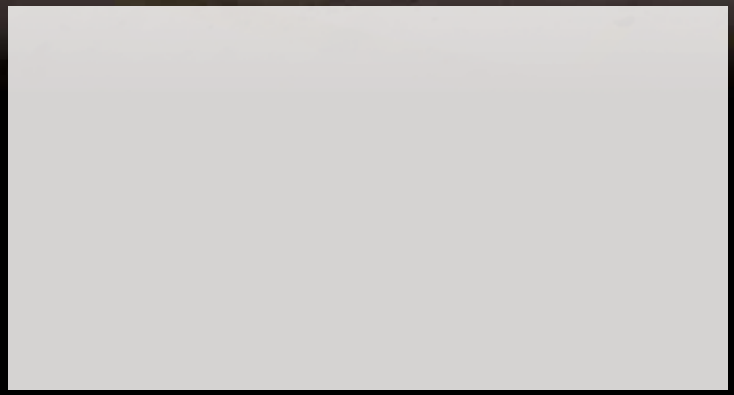
ST Tissue Converts UCFS Machine to Tissue



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FEATURE

ST Tissue Producing 310-in Semi-Creped Parent Reels on Reconfigured UFS Machine in Virginia

Machine that previously made fine paper is now one of the world's widest tissue units, producing quality napkin and towel grades for AFH markets

KEN PATRICK

In February of this year, ST Tissue started up one of the widest, if not the widest, and most cost-effective tissue machines in the Western Hemisphere (possibly the world) at Franklin, Va., USA. PM 6, which formerly produced uncoated free sheet (UFS) at International Paper's idled fine paper mill in Franklin, was converted by ST Tissue to tissue parent roll production for away-from-home (AFH) markets. It is capable of producing up to 310-in.-wide reels of semi-crepe tissue for customer conversion to napkins and towels in both white (bleached) and brown (kraft) grades. Some bath tissue also has been produced on PM 6, but typically it produces towel and napkin grades.

The Franklin operation currently employs 80 workers. Some 50 of these employees previously worked at the fine paper mill before it was idled in 2010.

By May of this year, PM 6 was through its startup curve and producing near the anticipated rate of 200 tpd (approximately 70,000 tpy). It uses recycled fiber collected from metro-markets in both the Northeast and Southeast U.S., including Raleigh-Durham, N.C., Hampton Roads, Va., Washington, D.C., Baltimore, Md., and Philadelphia, Penn. It also has the capability to use purchased virgin pulp as needed in its fiber mix.

ST Tissue purchased both PM 6 and PM 5 (also a fine paper machine) as well as the fiber recycling plant (FRP) that was used to provide furnish for UFS production at the mill. The company can optionally convert PM 5 to tissue production at a later date if markets favor the added capacity.

ST Tissue operations at Franklin are owned and operated by TAK Investments of Gaithersburg, Md., headed by entrepreneur businessman Sharad Tak. The group also owns the ST Paper mill in Oconto Falls, Wis., which it acquired in 2007. The Oconto Falls mill also uses recycled fiber to produce some 70,000 tpy of tissue parent reels for the AFH market. It currently has nearly 100 employees.

TAK Investments acquired then converted a former uncoated freesheet machine and converted it into a tissue machine at Franklin. Additionally, it is leasing certain land and buildings at the mill, including a section of the building that houses PM 6 and PM 5, the former engineering and human resources buildings, the former sheet converting plant, the FRP building, and space for vehicle parking. The former finishing area is now used as warehousing space of about 400,000 square feet.

To gather more information about the converted tissue operations at Franklin, TAPPI's *Tissue360°* magazine recently met with the mill's management staff, including Bill Culek, VP and GM; James Maness, mill manager; VP Sahil Tak; and D. Kesavaraman, plant engineer. Maury Keesler, former general manager at Oconto Falls, who provided technical leadership for the Franklin project at the time, also participated in the meeting. The highlights of this discussion are included below.

CONVERTING FROM UFS TO TISSUE

The stock preparation section of PM 6 was kept basically intact, except that the centrifugal cleaners were eliminated. If the mill decides in the future to use virgin fiber in its mix, purchased market pulp can be added through stock preparation.

PM 6 is a fourdrinier machine that had a four-nip press, and a conventional drum dryer arrangement when producing UFS. In the conversion, the forming section was basically retained, with just minor modifications. Keesler explains that "the only thing we really did was

Wide-angle view of PM 6, with the fourdrinier forming section on the right, yankee dyer and hood in the center, and after-dryer section on the left.

In the conversion, the forming section was basically retained, with only minor modifications to the forming board and decommissioning of about half the vacuum.

Bill Culek, vice president and general manager.

James Maness, mill manager.

D. Kesavaraman, plant engineer, ST Tissue, Franklin, Va.

change the forming board with some different blades. Otherwise, the forming board design remains basically the same. About half of the machine's vacuum capacity was decommissioned, since not nearly as much vacuum is needed with tissue as with fine paper.

The wet end white water is processed with a conventional fiber saveall recovery system that was in place, according to Culek, "but required some modifications and fine tuning," he adds, noting that "freeness and other characteristic are very different for tissue compared with fine paper. Some of the white water is recycled to the FRP for reuse, and wastage removed from the white water loop is sent to waste treatment.

Most of the existing press section arrangement was eliminated, Keesler continues. "About the only thing we reused was the felt conditioning section from the first press. The press section currently is a single felted, single pressure roll configuration—a conventional tissue press."

Paperchine provided the technical knowhow for the rebuild. They were accountable for the entire machine, plus they provided the rebuild parts—the supports, the structural steel, etc.—that were required to rebuild the press and support the yankee dryer, along with the rebuilt after-dryer section. Sandusky International (part of MetalTek International) provided two suction pressure rolls, and PMT Italia supplied the yankee dryer and the doctor blades. Andritz supplied the yankee hood.

WHY SEMI-CREPE?

Many or most tissue machines that run dry crepe primarily produce bath tissue. The dry crepe sheet is completely dry when it exits the yankee creping blade, and goes straight to the reel. Keesler explains that on the heavier weight and mid-weight grades, there is some quality and productivity advantage to coming off slightly wet and doing the rest of the drying with an after-dryer section. The sheet loses some of its "creping" and tends to have a bit more stiffness. Also, wet- or semi-creped products that are embossed tend to hold their embossing a little better.

The biggest driving force for going semi-crepe at Franklin was the market, Keesler adds. "There is a lot of competitive capacity coming online that competes in the dry crepe market. We've been in the parent roll business a long time and we felt that the market was looking for a good, competitive wet crepe machine, especially on the East Coast. So from there, we looked for an asset that would help us meet that need . . . and Franklin is it."

"We basically put in all new drives," Keesler notes, which were supplied by G.E. "ABB reconfigured the existing DCS, and a local company, Repairtech, handled refurbishment of most of the mechanical equipment (vacuum pumps, bearings, etc.). Repairtech also assisted with some of the actual machine rebuild activities. C.R. Meyer was the primary contractor that installed the yankee dryer and most of the major rebuild components."

The 12-ft.-dia. PMT yankee dryer, a grooved cast Iron unit with six condensate headers, was shipped from Europe, unloaded at Norfolk, Va., and delivered by truck to the mill.

The existing dryer section was torn completely out. Now, coming out of the press section, the sheet passes directly to the yankee, and is creped off at about 85 percent dry. From there it goes into an after-dryer section comprised of eight dryer drums (6 ft.- dia.) from the existing UFS dryer section that were inspected and put back in service. The drums were reconfigured and set up to handle tissue (design done by Paperchine). In the after-dryer section, the sheet is dried to 94-95 percent dry. From there it goes to the reel.

The 12-ft.-dia. PMT yankee dryer is a grooved cast iron unit with six condensate headers, "outrigger" type condensate pickups, and a 125 psi rating. Keesler says that the yankee was put on order in August 2011 and delivered a little more than a year later. It was shipped from Europe, unloaded at Norfolk, Va., and delivered by truck to the mill. The existing PM 6 size press pulper was relocated to the yankee pulper position. SKF provided components and design services for an entirely new lubrication system.

Currently, Maness says, the mill is using a combination of AstenJohnson fabrics on the wet end and Albany International fabrics in the press and dryer sections.

The existing PM 6 UFS reel was modified to handle tissue, a much lighter sheet, and relocated. "To handle tissue, the main thing we did to the reel was put on primary arm nip relieving," Keesler explains.

Most of the existing press section arrangement was eliminated, and the new section is currently a single-felted, single pressure roll configuration.

The tissue mill currently makes single ply tissue sheets. However, it could make a two-ply sheet in the rewinder section. In fact, it did acquire a second off-line winder from the previous owner. "If the market looks like it's going to demand it, we will get that winder up and running," Culek says.

According to agreements with the previous owner, all of the other machine equipment not used in the tissue conversion was scrapped. However, ST Tissue did retain whatever spares were needed.

The mill can ship by rail or truck. There are rail tracks at the paper machine area, "so we can ship direct, Maness says. "We also move some product to the warehouse and ship out by truck. At this point, it's all truck."

The mill secures its support services from the previous owner—process water, waste treatment, landfill, steam, etc. It buys power from the local utility.

FIBER RECYCLING PLANT

The FRP is a long way from the tissue machine—nearly a mile. A series of tube/belt conveyors takes the pulp from the final stages of the twin wire presses to the stock preparation area. Currently the mill runs a mix of sorted office waste (SOW), white ledger, and other grades for its bleached tissue grades.

The towel and napkin grades include bleached and kraft (made with OCC, kraft clippings, and also some ONP). The FRP can produce up to 250 tpd of recycled fiber, which reportedly was the former owner's rate. Pulp goes through a twin-wire press and is sent at 40-50 percent moisture via the tube conveyor to the machine room. The

FRP also has the capability of making wet lap pulp, sending pulp to the tissue machine, or both.

The FRP has three-stage deinking, but ST Tissue is currently running a shortened process, Culek says. "It's not currently necessary to run all stages of that process, though they are available to us if ever needed. We are still working through process optimization of the FRP—yield, costs, etc. We do washing, flotation deinking, cleaning, etc., but at this time we are not bleaching or brightening."

Culek emphasizes that 70 brightness on the reel "is where we need to be for tissue. Again, we're trying to stabilize on the best mix and optimize the process. When we get the process very stable and cost it out well, then we can work at fastening down our mix."

Culek also notes that the tissue mill has investigated bleaching, and probably will do some further down the road. But right now it depends on washing and flotation to get the brightness it needs. "When deciding what was best for our operations, we looked at what's the best fit from a furnish perspective, a yield perspective, and a processing cost perspective at the quality levels we need. As we move forward in time, we will adjust our mix as needed."

PRODUCTS AND MARKETS

Sahil Tak explains that PM 6 is a very large machine, "so we can take advantage of the economies of scale." The ability to produce a 306 in. to 310 in. tissue reel "is pretty unusual," he adds.

Currently, the tissue mill produces 306-in. reels with trimmed edges, and a little bit wider with deckle edges. "Actually we're working at being able to take the parent rolls right off of the reel. That way we could expand our capabilities to 310 in. We can do various core sizes on the rewinder by setting the core chucks to different core sizes," Tak notes.

Environmentally, he says, "we use a high percentage of post consumer fiber and we don't use any chlorine compounds in our process. So we feel we are able to fit most environmental standards and certification processes that are out there today." In fact, he adds that "we are in the process of getting approval for several environmentally conscious products."

The tissue mill slits and sells various widths of rolls—102-in., 105-in., 106-in. at diameters up to 68-in. Tak says that actually there is no maximum width, dependent on the size of the truck. The slitter can produce down to 11-in.-wide rolls. Tissue sheets range in basis weight for 11 to 24 lbs. per 3,000 square feet. "Eventually, we'll be able to go even higher on the basis weights," Tak says. Stretch ranges from 5 percent to 12 percent.

The FRP plant is producing higher quality fiber than what is typically used to produce tissue, Tak notes, which potentially provides a market advantage, especially with future products. "Roll finishing is done onsite, and we do a premium wrap job, using poly wrap with chip board headers on both ends. We also make customer specific labels with bar coding capabilities."

The tissue mill has the capability to produce white, kraft, and pastel colors, such as blue, mauve, and green. "We can produce the pastels with our process, but we haven't explored that market yet," Tak says.

Tak also points out that the location of the mill "puts us in a good freight rate zone for converters and customers we are targeting. We feel that with our location, the machine we have in operation right now, and the flexibility of the FRP, we can fit most customer needs from napkins to towels. That's what's exciting for us."

Culek adds that "we've sold into the Southwest, the extreme Southeast, the Northeast, the Midwest, and Mexico—we've literally shipped to all four corners of the U.S. This location is somewhat unique. There is a fair amount of tissue capacity in the Northeast—and a lot of that is pretty old. We think we are well positioned between the Northeast and the Southeast from a wastepaper perspective and the ability to compete in those markets."

The feedback from customers, Culek says, "overall is very good, especially since we worked through our startup problems. Some of our customers are providing us regular feedback on issues and opportunities and the good things they see overall. Most of the customers who came with us at startup continue to be strong partners, and we're continuing to develop those kinds of long-term relationships with newer customers. Based on our customer response so far, we're meeting the needs of the marketplace."

PROCESS ADJUSTMENTS, MODIFICATIONS

As Culek points out, sustained production on PM 6 is "not quite at 200 tpd yet. But we can run that," he adds. "Some of it is performance issues and some is mix issues. We are at considerably lower productivity on our lightweight grades, so we're building volume on toweling grades, as we develop the customer base."

The tissue mill had some challenges on the winder when it first started up, Culek continues, "and that held us back a little. Another issue was that this machine had a fine paper pickup system. So there have been some learning and optimization challenges in that regard.

The after-dryer section is comprised of eight dryer drums from the existing fine paper dryer section that were reconfigured and set up to handle tissue.

The slitter rewinder can produce various sized rolls at diameters up to 68-in., with width dependent basically on the size of the truck.

We made a number of modifications a few months ago that solved most of those problems for us."

As Kesavaraman explains, the winder was designed for a fine paper machine. "If you were to build a new tissue machine, you would have a tissue winder with a belt-driven unwind. So, we developed a proprietary system that uses electronics that simulate the belt drive without having a belt drive there. It's the first time, as far as we know, that that's been done."

LOOKING AHEAD

According to Culek, PM 6 has the capability to produce all of the products the tissue mill initially intended. It is exploring the possibility of making some products that weren't on the original list, e.g., bath tissue opportunities, which will require a little more development. From an FRP perspective, he says, the plant has made continuous progress toward its goal.

"In your initial plans, you can start by optimizing yield or mix, or both. In regard to the FRP, we chose to get the yield where it needs to be without really knowing what the previous owner was doing or getting. And we quickly discovered that the process wouldn't deliver what we needed. The quality was too high and the waste levels also were too high for what we do. So it's been an optimization challenge—how do we reduce waste levels and how do we get the costs where they need to be, in balance with the finished product all the way through.

"We still have a way to go—building our base, fine tuning our operations, tweaking and modifying the processes, etc. I've been a part of numerous startups, and in every one we came together to get a very detailed plan of all of the changes we needed to make. Normally, 95 percent of those things are right. But there's always the 5 percent where you have to modify. We've taken care of a lot of those issues, and now we've reached the point of becoming good at what we do—the procedures and execution—all of the systems are in place."

As far as converting PM 5 to future tissue production, Culek says that the company will look at what it might want to do after fully developing its supply chain and customer base at Franklin. "If at that time there's more need, we will look at the options of what we can do with PM 5," he says, pointing out that despite similarities, PM 5 is altogether "a different machine."

PM 5 is roughly the same age as PM 6 (both machines were built within a year of each other) but it is somewhat narrower. It is roughly in the 250 to 260 tpd production class.