



# Rebuilt PM26 at Biron to Serve as Workhorse for LWC Rotogravure Grades

Stora Enso North America starts up PM26 after recently completing Phase II of a \$77 million upgrade to boost speed and operating efficiency.

**By Ken Patrick,  
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*Above photo: In Phase II, PM 26 former modifications were aimed at improving dewatering and overall runnability. The press section was converted from a four-nip arrangement to a three-nip configuration with a shoe press in the third position. The dryer hood extension to cover a new, two-can dryer section constructed in the space left-over from the press rebuild, is seen in the far right.*

STORA ENSO NORTH AMERICA recently completed the Phase 2 rebuild of PM26 at its Biron, Wis., mill, the startup culminating a major restructuring of production assets at this facility. The Biron project, which included the permanent closure of two older, outdated paper machines, is part of a division-wide, \$250 million restructuring effort known as the Profit Enhancement Program (PEP) that has impacted all eight mills that make up the North American division of Stora Enso.

The \$50 million Phase II project at Biron started up February 5, on the heels of a \$27 million Phase I project that focused on infrastructure and various efficiency enhancing improvements. The Phase II project on PM26 included rebuilds of the press (shoe press added), coaters, reel, rereeler, supercalenders, and a new winder, along with other system upgrades. The projects increased machine operating speed capacity from around 4,100 fpm to 4,650 fpm. Production capacity (primarily No. 5 LWC) was boosted from 177,000 metric tpy to 230,000 metric tpy.

Closure of the technically obsolete No. 23 machine at Biron in 2002, followed by No. 24 in 2003, respectively removed 50,000 metric tpy and 70,000 metric tpy of LWC production from the mill's portfolio, which is being replaced

by the 53,000-metric tons gained as rebuilt PM26 ramps up toward full capacity this summer. The mill's No. 25 machine, with a current capacity of 130,000 metric tpy of No. 4 and No. 5 LWC papers, had been rebuilt by Consolidated Papers in 1999 to include a new former, press section, and off-machine coater.

### Profit Enhancement Program

In August 2002, two years after Stora Enso acquired Consolidated Papers and formed the North America division, it launched the three-year PEP effort to restructure and optimize mill assets in the U.S. and Canada. PEP has four elements that affect the entire North America Division, including marketing and sales.

As Asko Hyttinen, senior VP of strategy, investments, and mergers and acquisitions, explains, the first element focused on closure of outdated paper machines and pulping lines. This step is now complete, he notes.

Element two involves division-wide product optimization, i.e., optimizing the product mix for each mill and various machines. This is an on-going effort. "Product optimization is a challenging process that we sometimes refer to as our product carousel," Hyttinen says. "This is not yet complete, but it's proceeding very well. Actually, in some areas, we're exceeding our targets for this part of the program."

The third PEP element is related to the first (closure of outdated machines) and involves what Hyttinen refers to as workforce "rightsizing." Stora Enso North America has undergone a workforce reduction of some 2,300 employees, from around 7,300 when it acquired Consolidated in 2000, to the current 5,000 workers, due partly to closure of outdated, non-competitive paper machines and pulping lines.

The fourth element involves significant capital expenditures, to the tune of some \$250 million as noted above, to improve the efficiency and performance of SENA's most modern and best paper machines and pulping operations throughout the division. Funding for the Biron mill's Phase I and Phase II PM26 upgrade projects came from this capital infusion part of the program.

So far, seven of the eight planned capital improvement projects in the division's profit enhancement program have been completed, the Phase II rebuild of PM26 at Biron being the seventh and most recent. The eighth project—a press section rebuild on PM64 at the Whiting, Wis., mill—is scheduled for early 2006.

In rebuilding and restructuring its North American assets,



Stora Enso's objectives have not been to increase capacity, but rather to boost profitability and better position itself in the global marketplace by maximizing efficiencies, reducing production costs, and positioning selected machines farther up the value-added ladder.

Hyttinen points out that from an overall perspective, there will be a slight net capacity gain considering production increases realized by the capital investment program compared against tonnage withdrawals due to the shutdown of older machines. "The slight capacity gains are in the coated fine papers and coated specialty papers segments. We will correspondingly reduce our exposure in the LWC ground-wood containing grades," he adds.

### Committed to North America

When Stora Enso acquired Consolidated it had only one mill in North America—the Port Hawkesbury supercalendered and newsprint mill in Nova Scotia. Shortly after the seven-mill Consolidated acquisition was closed, prices for almost all grades produced at these assets began eroding as the North American paper industry entered a severe business downturn from which it has only begun emerging in recent months, and then only in certain grades.

With marketing conditions worsening (prices fell 20%-35% in the first year of the acquisition), "it was a tough call for even the world's biggest paper company to go forward with plans for these assets," Hyttinen points out. Stora Enso's timing, as luck would have it, turned out "not to be so good," he adds.

"But of course the first years of a major acquisition such as this are the most decisive. The fact that the company went forward with its major investment plans here, especially at a time when other paper companies in this part of the world were significantly cutting back on capital spending,



PM 26 two-roll machine calender (left) and the first of two rebuilt, online short-dwell coaters (on right), one for each side of the sheet.

clearly shows Stora Enso's commitment to North America," Hyttinen says.

"North America is still the biggest and one of the most demanding paper markets in the world, though it's continuing to go through some adjustments due to changing economic conditions, increasing imports, etc. We have done whatever necessary to make our platform here substantial, reliable, and profitable. We will use that platform as the basis for going forward in the future.

"As Stora Enso has consistently said during all we have done here, we are constantly looking for and exploring new opportunities for growth in North America. This could take the form of further acquisitions, but even a new mill cannot be ruled out of our future plans. We would be very cautious in this regard, of course. Building a new mill in a market where imports are increasing and demand is not growing in some segments would not be an easy call," Hyttinen explains.

### Rebuild of PM26 at Biron

Hyttinen notes that PM26 at Biron is the division's "workhorse" for LWC papers produced exclusively for rotogravure press applications (mainly catalog). He says that it is currently "among the best" paper machines in North America making this grade, adding that "we plan to make it the very best."

PM26 trims 292.5 in. at the reel, producing 30-40 lb/3300 ft<sup>2</sup> LWC papers. Basis weight of the base sheet ranges

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from 20-28 lb/3300 ft<sup>2</sup>. The furnish used on PM26 is thermomechanical pulp (TMP) and stone groundwood, with some softwood kraft and clay filler.

According to Ryan Kluck, PM26 project manager, Biron Mill, the machine was rebuilt in two phases rather than one for several reasons. There were some 25 separate improvement projects in the PM26 upgrade program, he explains. Phase I, completed in May 2003, focused on infrastructure and efficiency enhancing projects. Phase 2 focused on speed and production increases as well as enhanced efficiency.

"The rebuild program involved some relatively new technologies, and doing it in two phases allowed us to run several trials with our suppliers to make sure that these new technical concepts would work for us. At the time, the division was in the midst of PEP, so we wanted to undertake the first and easiest projects right away and then more carefully determine and understand what the new technologies implemented in Phase II could bring us," Kluck says.

Major aspects of the Phase II rebuild were delivered and engineered by Metso Paper. Engineering management was handled by the division's engineering group of 12 out of Wisconsin Rapids, Wis. Jason Shields served as the engineering manager and Dave Panzer handled the electrical engineering. Mitch Wayne of division engineering was the project construction manager, working with a Boldt Construction team. Much of the civil engineering on the project was handled by Jacobs Engineering, which also handled some process and instrumentation related engineering.

### Stock Prep and Wet End Improvements

To satisfy the demand for more stock, the PM26 stock preparation section received bigger pumps, motors, and variable speed drives, supplied by Rockwell. The stuffbox was removed and a variable speed drive was installed for delivering stock to the machine. A new thin stock slotted screen, supplied by Voith Paper, was also installed.

In 1996, PM26 had received a new Voith dilution con-

trolled headbox and gap former. As part of the Phase II rebuild, Voith made some improvements to improve dewatering. A wet suction box was added to the gap former and some changes were made to the ceramics used in the top dewatering box. Some rolls were relocated to enhance the runnability and speed potential of the former.

The machine's original four-nip press section was converted to a Metso SymPress B concept. The old fourth press was removed and the third nip was replaced with a Metso SymBelt extended nip shoe press. The center roll in the old configuration was replaced with a new SymRoll ZLC center roll with a PressJade ceramic cover. A new Metso profiling steambox was installed just beyond the suction press roll prior to the second nip. The belt used on the SymBelt shoe press has thus far been supplied by Voith Fabrics.

In converting the press from a four-nip arrangement to the three-nip configuration with a shoe press in the third position, a significant amount of the original press was maintained. The existing first nip, pick-up, and bottom felt arrangements were re-used.

Maximum nip loading in the third shoe press is 5,714 pli (1,000 kN/m). The shoe press is significantly improving solids out of the press section, allowing the needed increase in speed and/or reduced drying energy, Kluck reports.

### Dryer Section Upgrade

With the removal of the old fourth press, there was some "leftover space" between the press section and the machine dryers. This was filled, Kluck notes, by "in essence, creating a new, short dryer section." Two old dryer cans left over from modifications to the coater section in Phase I were reconditioned and installed along with two new Metso VacRolls to configure the new mini-dryer section. The main dryer section hood was extended to cover these new dryers.

In Phase I, one of the double-felted, eight-can dryer sections was converted to a single tier configuration. The new, short dryer section is now designated as Section A, which is then followed by the first, second, and third UniRun sections, and the fourth and fifth double-felted sections.

Other improvements to the dryer section included new stationary syphons by Johnson Corp. in all of the dryer cans, replacing the original stationary syphons installed on PM26 when it started up in 1986. Metso also installed several runnability improvements, including a new PressRun roll, PressRun blowboxes, HiRun blow boxes, and UniRun ventilators.



Both on-line coaters received new short-dwell coating heads in the Phase II rebuild, and the coating color delivery system was upgraded for faster, more reliable delivery.

### Rebuild of Coaters

PM26 has two on-line short dwell coaters in tandem, one for each side of the sheet. Metso replaced the old coating beams with its new OptiBlade technology. The new short dwell coater heads have an internal screen plate to cut down on streaks caused by vortices in the chamber.

The new coater beams also have two-circuit beam temperature control with a built-in laser to measure beam straightness, for fast break recovery and profile stability. The thermally stable water heating system provides rapid adjustments to keep the units aligned and operating at peak performance.

Kluck says that the existing coat weight profiling system was re-mounted into the new configuration, which also re-used the old coater head frames, pivoting arms, and backing rolls as well as the color return pans. He adds that the entire coating delivery system from the coating color supply tank at the machine to the coater heads was upgraded for faster and more reliable delivery. Piping changes included new OptiAir deaerators.

Upgrade of the coater threading systems was begun in Phase I and completed in Phase II, Kluck notes. The first coater received new Metso FoilForce conveyors in Phase II, similar to the conveyors which had already been installed on the second coater. The coater station after-dryer was configured into a UniRun arrangement with new UniRun blowboxes. This was done, Kluck adds, in anticipation of speed increases.

"As yet, we have not experienced a significant change in the overall efficiency of the coater stations, but we're still in



New parent reel carts operate between the re-reeler and the calenders, and between the calenders and winders.

a learning curve and I think these improvements will soon come. We are experiencing some improvements in quality off of the coater,” Kluck reports.

### Reel, Re-Reeler, Supercalender

The original reel on PM26 was completely replaced in Phase II with a Metso OptiReel-Plus with 40-in.-dia reel spools. The new unit produces 130-in.-dia (maximum) parent reels. The transfer line was completely rebuilt, including new transfer rails and indexing stations, to handle the larger spools and the bigger parent reels.

New water jet tail cutters (Jet-X 4000) and trimming equipment (Trim-Jet) by Paprima Industries were installed on the machine and at the OptiReel.

The re-reeler was rebuilt by Metso. It was basically raised up and reinforced to be able to handle the larger size reels. New parent roll carts were installed to operate between the re-reeler and the calenders, and between the calenders and winders. A new web digital defect detection system supplied by ISRA was installed at the reel/re-reeler.

The two 10-roll supercalender stacks received significant upgrades. The unwind and wind-up stands were modified to handle the larger parent rolls. Metso AutoSplice was

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installed for unwinds and wind-ups, and an OptiWind rider roll device was installed on the wind-ups. The supercalender drives were upgraded with Rockwell Digital Drives.

### New Winder

Prior to Phase II, PM26 had an existing two-drum winder and a Valmet JR 1000 winder. Because the machine already had two existing winders, upgrades were not designed for added capacity but rather to improve winding quality for rotogravure presses.

The two-drum unit was replaced by a new Metso WinBelt L winder with an 8,500-fpm drive speed. This new winder has AutoReel and AutoSplice capabilities on the unwind stand and also has automatic core gluing. Kluck says that change time within one parent reel is now under a minute.

The existing JR 1000 winder was rebuilt to handle larger parent rolls and the 40-in.-dia spools.

### Other Area Upgrades

The machine’s drives were largely replaced in Phase I, with most of the associated new motors in Phase II being supplied by Rockwell Automation/Reliance Electric. Kadant supplied some of the doctoring equipment for the project.

Most new and some existing control loops on PM26 are handled through Allen-Bradley Controllogix PLC’s. Also, the existing Bailey DCS system is used for many control loops. The dryer system is controlled by Johnson Systems–Dryer Management System.

Kluck emphasizes that the Phase II rebuild of PM26 was a collaborative effort by many skilled and dedicated team members. “We had a lot of different suppliers involved in this project, and things went very well,” he says. ■