



View of machine hall from dry end

AS GREEN AS YOU GET

By GRAEME RODDEN, Executive Editor

FutureMark Paper's embracement of the growing "green" marketplace has resonated strongly with customers

Working under the principle of 'build it and they will come' from the movie, *Field of Dreams*, FutureMark Paper found the right customers at the right time for its line of publication papers.

Already given a headstart from previous mill owner Myllykoski's foresight in building a state-of-the-art deinking plant, FutureMark has grown its "green" business by leaps and bounds, especially in the last half of 2010. Other factors such as an increase in paper prices and the closure of some possible competitors have also helped.

In the words of Stephen Silver, president and CEO, sustainability has evolved from "tree huggers" to a Fortune 500 necessity. The timing could not have been better for FutureMark, which began life as an urban mill in Alsip, IL, bordering on the southwest

side of Chicago. The mill was opened in 1968 by the Chicago Sun-Times newspaper organization as a recycled newsprint producer. After going through a few owners, the mill was bought out of bankruptcy in 2000 by Finnish-based Myllykoski, which folded it into its US subsidiary, Madison Paper Company.

In 2002, Myllykoski invested \$200 million in the deinking plant. It also refit the mill's lone paper machine to produce coated paper, CGW No. 5 (Pulp & Paper, December 2002, p. 30). However, in 2007, Myllykoski decided to put the mill up for sale.

Enter Watermill, a private equity fund based in Lexington, MA, which has been in business about 30 years. It specializes in industrial businesses that have financial problems, but have features that provide the potential for good turnaround opportunities. Besides its pulp and paper experience, Watermill also has investments in metals-related businesses.

In the Alsip mill, Watermill saw an opportunity to push the "green" angle, but push it as it has not been pushed before. Therefore, in November 2009, Watermill bought the mill and renamed it FutureMark Paper Company and focused on developing a "green strategy". It was, as Silver says, to be a "pure play for green paper."

The strategy was based on consumer trends and

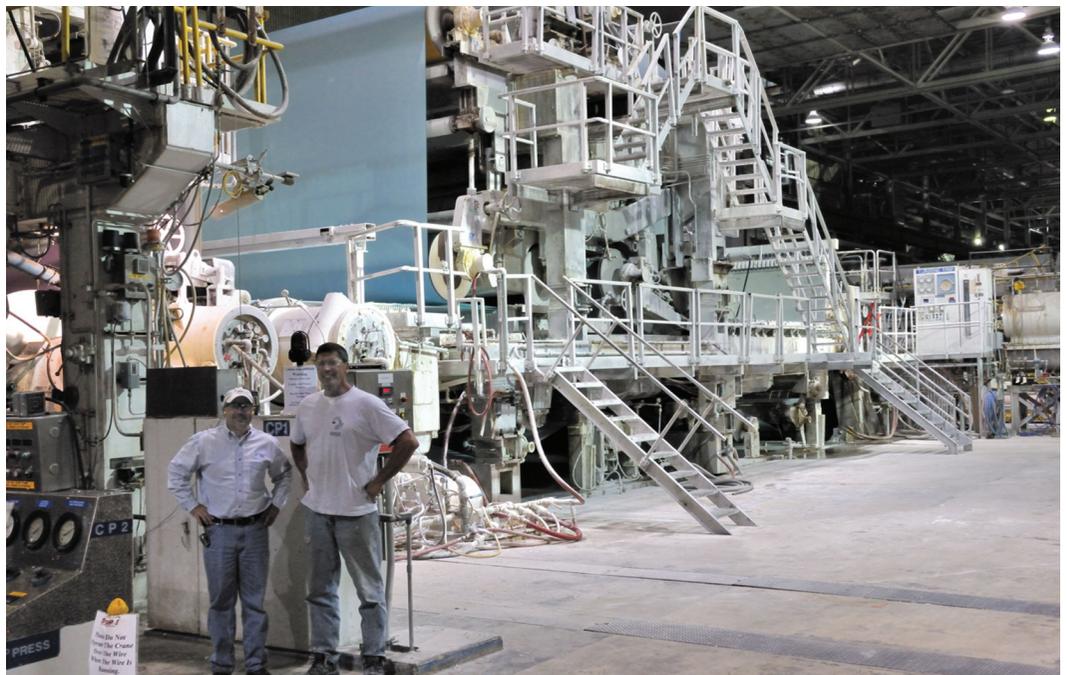
the fact that about one third of the mill's business was already green oriented from customers such as Dell, Staples and American cooking guru Rachael Ray. Reader's Digest decided to use FutureMark's paper in Rachael Ray's new cooking magazine that was launched in 2007 and now has a monthly circulation of more than 1.5 million.

In hindsight, the strategy may appear to be a no-brainer, but Silver adds, at the time, there was still a question mark about the quality and desirability of recycled paper, particularly for the applications that FutureMark planned.

Another question mark was whether the big paper users really cared about the green aspect. Were they just talking the talk and not walking the walk?

Silver and his team realized the mill's approach to marketing had to change. "When we took over, there was no marketing piece describing the benefits of using our paper. The deeper we dug, the better our story sounded, from emissions to water and chemical use," Silver says.

The Fortune 500 companies changed too, with change being mandated from the top down. "Green" was (and is) in and FutureMark was in a position to benefit from this. In less than a year since purchase,



Wet end from press section with Tim Serversen, a service manager for Paperchine (left), and Steve Bell, machine tender

its order backlog went from two weeks to 15-16 weeks. "We are winning major new accounts from environmentally-minded customers," Silver says. The market was ready for a solution to help companies improve their sustainability position."

New customers gained in 2010 include Home Depot, Walmart and Macy's, Office Max, DIRECTV and the in-flight magazine for American Eagle. "We picked up 50 significant accounts in 2010 that equal more than 50% of our capacity."

Silver explains that over the years, "Corporate America has gone through a series of fundamental changes about what a good manager should be doing, from affirmative action to Six Sigma quality data. Now, carbon footprint and sustainability are important and companies are looking for help. We tell them the story of what we do, not just about the paper.

"Fear of making the wrong choices drives a lot of decisions," Silver adds. "We had to neutralize this fear. This meant marketing the solution directly to upper management, in addition to the paper buyer."

Before FutureMark took over, most sales efforts were left to brokers. "Sometimes, we did not know the customers," Silver says. "We started looking at who our earliest green end-customers were and then looked at other companies in the same industry. It went from there."

FutureMark still uses brokers, but it went to all its brokers and explained why its paper was different from a virgin sheet and why that was important. It is an opportunity for them to offer a differentiated product and win new customers.

Silver claims that FutureMark makes the "greenest coated paper possible. The number of motivated green companies is still growing rapidly and if we can get our message across, it will move down the executive chain to the paper buyers to look at us and evaluate our paper. We have all the environmental benefits with no sacrifice (e.g., cost, quality)."

Silver says there is another important benefit in finding the right customers. He believes that these companies are motivated to buy environmentally friendly paper and will be more loyal. "Our advantage was that we found customers who cared. We were the only ones in North America to be able to produce this type of sheet in the short-term." Thus, the analogy to the Field of Dreams.



Stephen Silver (left) president and CEO, with Steven Smith, vice president and mill manager, in the recovered fiber storage area

FutureMark's paper contains 90% recycled fiber, of which 30% is post-consumer waste. There are three main products:

- Future Connection, satin or gloss, 40-70 lb basis weight, 76 and 80 brightness;
- Future Choice, 45-70 lb basis weight, 82 brightness;
- Future ReMark, C1S label paper, 60 lb, used for such applications as soup cans, paint containers and other consumer products.

The label and Future Choice grades are still developing, Silver adds. The majority of production is still Future Connection. However, Silver says that Future Choice is growing by "leaps and bounds." The company is also looking at producing paper for pressure sensitive labels and digital printing presses.

CHANGE OF THINKING NEEDED

The mill produces about 90,000 tons/yr of deinked pulp. The mill's yield from its secondary fiber is about 80%. Chinese competition has forced FutureMark to accept lower quality secondary fiber. However, supply is not an issue. Silver says there is not much competition for a couple of reasons. Exports have driven the

cost up too high for some (particularly lower-grade papers such as tissue and newsprint). And, the higher amount of contaminants in the fiber means many less sophisticated deinking plants cannot remove them economically.

Silver says the volume of paper made from secondary fiber in the US is actually now falling, because some lower-end newsprint mills have closed and no new recycled mills have been built over the past two years in the US. He believes high waste paper prices, driven primarily by rapidly growing Chinese demand, is the main cause.

“There is no investment in recycled capacity. The US paper industry is missing a sea change in consumer demand.”

He adds that for 20 years the US focused on collecting waste to recycle so that now, about 65% of waste paper is recycled. “But, we are not focusing on the best use of what we collect. We set up a collection system for China. We need to start thinking that secondary fiber is not trash but a precious raw material and, if customers’ demand for higher recycled content is valued, then how do we meet demand in the future or do we leave it to foreign competitors?”

The mill is in a fortunate position as it has a large metropolitan area from which to draw its fiber. Fu-

tureMark deals with fewer than 20 collectors and gets about 90% of its fiber needs from within a 40-mile (65-km) radius of Chicago.

It buys mixed ONP, OMG and white waste (printer trim).

Since the mill does not bleach its fibers, it does not buy OCC or MOW, because such paper streams often contain colored fibers such as boxboard and manila folders. Steven Smith, vice president and mill manager, explains that most of the paper arrives in bales, although the mill prefers receiving it loose. The mill keeps a low inventory (about 4 to 5 days) because there is more than adequate supply available. Using fresher paper is good for the deinking process.

Along with the secondary fiber, FutureMark adds coating, pigments and kraft pulp to the furnish to produce 150,000 tons/yr of paper. The percentage of filler in the mix runs from 15 to 20%, 8-12% of which comes in the secondary fiber. On average, the mill uses 7% virgin kraft pulp, NBSK from western Canada, which gives optimum strength to the final product. When looking at total tonnage, coating is about 25-30%.

The quality of the baled paper from the printers is good. The baled waste collected from the area’s single stream collection system (post consumer) can have a contaminant level as high as 15%. This is mostly in the ONP and typical contaminants include glass, corrugated, metal and plastic.

The secondary fiber is blended manually from three piles: ONP, high bright and OMG. It is fed onto a belt that conveys it to the drum pulper. Deinking chemicals and water are added. Retention time in the drum is about 15-20 minutes.

Smith explains that the benefit of FutureMark’s process is that it frees the fibers from the contaminants without breaking the contaminants. “Contaminants and rejects stay whole so they are easier to remove. For example, the glue on the spine of a magazine comes out as a single strip. This is key to the success of our product.

“We are continuing to explore pulping chemistries to increase the yield and brightness,” adds Smith. “We are working with suppliers. We are also exploring neutral deinking.”

Out of the drum, the pulp is passed through coarse screens and cleaners before two flotation



The mill receives about 90% of its fiber needs from within a 40-mi radius of Chicago

deinking loops. Between the flotation loops, there is a disperger and peroxide brightening stage. Fine cleaning and slotted screening with 0.005-in. slots completes the process. Then, the pulp is then thickened and sent to the high-density chest.

"We can produce a little more than 400 tons/day of DIP," adds Smith, "but we can push it up."

Although FutureMark bought a world-class pulping process from Myllykoski, it has been able to increase capacity thanks to the work of fiber line director Wouter Peddemors who came to the mill following stints with Mondi and Pöyry.

Just before FutureMark took over, Myllykoski also optimized the process in "all aspects," according to Smith. "We were able to decrease the amount of high bright secondary fiber we needed and increase the amount of ONP while maintaining all the needed paper properties and increasing capacity by 20%."

Smith adds that the mill was able to virtually eliminate deposits on the paper machine by eliminating contaminated sources of secondary fiber and by using detackifiers. "Our pulp does not leave deposits on the paper machine wire or the calender rolls." Good design and operating procedures also helped in the fight against deposits.

The mill's one paper machine was rebuilt in 2002. It can run at 2,860 ft/min and produce an average of 425 tons/day. Trim width is 234.5 in.

The machine, coater and supercalender are all in one line. "The lean manufacturing design requires good reliability," says Smith. He adds that it also helps minimize spool losses.

In 2002, a new coater was added. "It gives us great flexibility in terms of coating both sides at the same time," Smith says. "It is very stable. There is also flexibility in terms of what we coat with and how much coating we use so it has allowed us to develop the label grade."

Although the coater is relatively new, the mill still uses its 1992-era GAW coating kitchen. But, FutureMark has made an important technological breakthrough. It uses a biolatex for part of its coating rather than a petroleum-based binder. It is the first North American mill to do so. The corn-based product is made by EcoSynthetix and comes in pellet form. It is mixed in with clay and replaces about half the conventional latex in a 1:1 ratio. Although it uses the



Treatment of incoming canal water with polymer-activated sand sedimentation

product as an environmental measure, FutureMark found it also saves money.

Other work done in 2002 included the total reworking of the DIP plant, the installation of an air flotation dryer, the Voith Janus inline supercalender (eight rolls: three hot, five soft), a Voith Sirius reel, Metso Winbelt winder with semi-automated wrap line, Metso DCS and QCS, a new kraft pulper and incoming water treatment plant.

The machine has two presses: a ceramic in the first position and a granite Sym-Roll in the second that will be changed to ceramic in 2011.

The center-wind reel was installed to provide good reel structure to allow the mill to operate the winder at its top speed of 7,000 ft/min.

The mill has a preferred source chemistry contract with Ashland Hercules Water Technologies: retention/formation/drainage and deposit control (including biocide).

With many big printers in the Chicago area, the mill is well located to help keep transport costs down. Approximately 50% of the commercial printing in the US is done in the area, so the lion's share of the mill's business is in the US Midwest. Transport is done by truck and rail, although for outbound shipments, the mill finds trucking to be more reliable. Printers and publishers are becoming more conscious of their environmental footprint, Silver adds, so there is more of an effort to match the paper source with the printer.

DOING THE JOB

Since 2002, there have been no major projects and the mill has been operating at or near full capacity. "It's doing the job that FutureMark wants it to do," says Smith. "There are no major expansion plans. We are focusing on increasing tonnage through process improvements, mix optimization and improved availability."

The mill is doing a "good job" in the reliability area, Smith adds. There are also good maintenance systems in place. FutureMark still uses the Myllykski-installed Idcon systems and, working with Canadian-based Asset Performance Group, has expanded its maintenance program to include RCM2. RCM2 is a structured program to improve manufacturing reliability with the best use of available resources. The system encourages operations and maintenance teams to work collaboratively in evaluating the performance of process equipment and their individual components and subsystems. Having a multidisciplinary, detailed and nuanced understanding of manufacturing components provides insight into how to tailor preventive and predictive maintenance

programs so that incipient problems can be detected early enough to repair them before failure.

"Reliability is really important for us," Smith stresses. "RCM will help us continue to push the envelope and see how far we can push the technology. We think we have significant opportunities left."

The mill tries to schedule a 2-3 day maintenance shutdown annually for big jobs. It is also closed two days at Christmas. There are normal roll/clothing changes every five weeks.

With just one machine and using mostly secondary fiber, the mill uses relatively little water: 27 m³/ton. This is one reason why it has a very different wastewater treatment process. After fiber recovery using a dissolved air flotation system, the resulting wastewater is clean enough to be returned to the municipal water recovery district treatment plant that discharges upstream of the mill's intake into the Calumet Saginaw Canal. Therefore, says Smith, "In a sense, we are closed cycle."

The mill has also found a use for its 25,000 tons/yr of deinking residue. Smith says the company looks upon it as a byproduct rather than a waste stream. The deinking residue, which is high in calcium, is licensed for agricul-



**Voith Janus on-line
supercalender**

tural use in Indiana and is applied as a fertilizer rather than being sent to landfill. The high-calcium paper lime, which serves as a substitute for mined lime, makes fertilizer more effective.

The product was developed in a long-term project headed by the mill's Glen Johnson. He founded a partnership with an Indiana farmers' cooperative. The paper lime is mixed with manure and spread. "Nothing needs to be done to the raw product," says Smith, "except to pay attention to the process. Because we use a minimal amount of chemicals in deinking and we control our waste papers, it gives us a consistent product."

The material has been approved for use by authorities in Indiana and Illinois.

The mill's power comes from two natural gas fired boilers. It has two 30-MW transformers that are fed by different tie lines. The mill can be run on one of each if necessary. That's because there used to be an adjacent SCA tissue mill that was shut in 2008 and is now being dismantled. Smith adds that FutureMark is continuing to look for ways to save energy. Possible alternatives include a biomass boiler or a CHP unit.

At present, one boiler can deliver 90,000/hr of steam (400 psi) to the mill although this can be upped to 110,000 lb/hr.

GROWING EVERY DAY

With all that FutureMark has accomplished, where does Silver see the mill going in the next five years? "If this was a less capital intensive industry, we'd be looking at how to build another mill, but it's too capital intensive now.

"We see our strategies working. We are looking at complementary businesses and products. We are also maximizing productivity from the mill."

He adds that it has only been since mid-2010 that FutureMark has seen any real success. "Verbal commitments turned into orders. In June and July, it snowballed. Now, it's how to enhance the business. Because maintenance is so important, we have increased employment by 12% (up to 165 employees total) since the purchase and we will be hiring more high-end technical people in 2011."

As for product development, Silver admits there is a limit to the company's ability to develop products

because it is a one-machine operation. FutureMark does work with the Rochester Institute of Technology (RIT) on trials. "When we bought the company, there were certain strengths here but there were some missing so what we have done in the last year is go outside and hire specialized sub-contractors," Silver explains. This helped fill the voids.

One such area was marketing. "Traditionally, there is not a lot of marketing done in publication papers," Silver adds. "So it makes more sense to go outside. We found contractors who really like to work with us because of what we're doing.

"We sought out companies that our message would resonate with. We did pinpoint marketing by searching websites where green paper purchasing practices were specifically mentioned by customers. We have a sophisticated marketing program."

Other areas of study include nanotechnology to reduce water use. FutureMark is also evaluating kraft pulp alternatives made from agricultural waste products (non-wood fibers). Another possibility is nanotechnology surface treatment to increase deinked pulp strength and help reduce kraft pulp use.

The company is pursuing closed loop recycling with its large customers whereby they will collect their waste books, magazines, catalogues, etc. and return them to FutureMark to be made into new paper.

Silver is exceptionally proud of the mill's environmental performance. "There are different shades of green. Ours is as green as you can get. Our VOC emissions are 7% of what they were originally. We use at least two million fewer gallons of water per day and one-third the energy of a conventional paper mill of our size."

The "green" market that FutureMark has embraced so fervently is still growing says Silver. "I don't think anyone knew how big it was because no one attempted to tap it. We've been tapping it for 10 months and it is far bigger than our capacity. It's growing every day. When the Fortune 500s do it, the mid-size companies are not far behind." **PPI**



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Paper



Shaping the Future of Paper

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