



LET IT ROLL!

Ontario packaging films producer keeps growing its share of global business with cutting-edge technologies and unwavering commitment to impeccable quality control

Tucked away in central Ontario, the town of Wingham, with its population of just over 3,000 residents, is in many ways a community of contrasts.

Located in the midst of rustic Menonite farm country, where time seems to have stood still over the last couple of centuries, it is the sort of a place where one is as likely to come across a horse and a buggy crawling up the road as an automobile.

On the other hand, Wingham was the first Canadian community outside a major urban center to have its own television station, and it is also a place of some considerable renown to the world's literary circles by virtue of being the birthplace of Alice Munro, one of Canada's most internationally acclaimed authors and a three-time winner of the coveted **Governor General's Award**.

The town also boasts some considerable bragging right on the industry front as the home base of **BI-AX International Inc.**, a company that is truly on the cutting edge of bi-axially oriented polypropylene (BOPP) films, widely used in numerous packaging applications, as well as the development and commercialization of other new oriented films.

The 225,000-square-foot facility, which employs anywhere between 30 to 80 people, depending on the flow of business at the time, churns out approximately 40 million pounds of plastic films per year, which it



The BI-AX International facility in Wingham, Ont., churns out approximately 40 million pounds of plastic films per year, including innovative biodegradable and microporous structures that have enabled the company to build up a loyal customer base worldwide, with end-use applications ranging from packaging to roofing.

ships to markets in North America, Europe and, to a lesser extent, South America.

Running its Wingham production line around-the-clock, on a five- or seven-days-a-week basis—depending on market demand—BI-AX also operates a smaller two-line, 40,000-square-foot production facility in nearby Tiverton, which focuses more on niche products and applications.

“What we primarily manufacture in Wingham is specifically for the packaging industry, and lot of it can definitely be called a commodity,” explains company president Dave Inglis. “The Tiverton plant does more of a custom work for certain projects, not commodities.”

Mike Olejnik, new business development manager at BI-AX, elabo-

rates further: “What BI-AX has done is find ways to take the equipment and provide significant modifications, so that these lines can produce more value-added materials.”

One relatively new product currently produced at BI-AX is **Evlon**—a crystal-clear, ecologically-friendly film made from the **NatureWorks PLA** line of resins pioneered a few years ago by Minnetonka, Minn.-based polymers producer **Cargill Dow LLC**, which uses natural plant starches—in this case corn—to manufacture PLA (polyactide) polymers.

With many regions and major population centers throughout the industrialized world often taxed to the limit by the constantly rising levels of industrial and residential waste,



The BI-AX International Inc. senior management team is comprised of (from left): general manager Tom Inglis, president Dave Inglis, and new business development manager Michael Olejnik.

the benefits of a biodegradable film structure like *Evlon* are pretty much self-evident, especially considering the relative abundance and renewability of the natural resources, such as corn, used in its manufacture.

The making of PLA begins with the trapping of sunlight—another vast resource that astronomers and astrophysicists figure will be readily available for about another 35 million years—inside tiny discs called chloroplasts, of which there are several dozens contained within each and every cell of the corn plant. The collected energy kickstarts the photosynthesis process, which makes the corn grow.

The starch used to manufacture the film is derived from corn by cooking it at a milling plant for 30 to 40 hours at 122°F temperature, after which the softened, swollen corn is ground by a machine to isolate the starch and convert it into sugar.

During the ensuing fermentation period, microorganisms break down the sugar and form lactic acid. When exposed to heat, the lactic acid molecules break apart, and the pieces are then linked together to form rings called lactide monomers. The chemically-treated monomers then open up and link together to form a long chain of polyactide polymer.

The hardened plastic which results

from this process of polymerization can be melted or formed into chips and pellets, which in turn can be used in a wide range of manufacturing processes.

The other specialty film manufactured by BI-AX, which also participated in its commercial development work, is the *Aptr*a series of microporous films owned by **RKW US, Inc.**, Rome, Ga.-based subsidiary of **RKW AG**

Rheinische Kunststoffwerke of Werkes, Germany.

The *Aptr*a Classic product is used extensively in the United States for disposable clothing for bio-hazardous working environments, as a packaging film, and in high-end analytical equipment, while the *Aptr*a UV8 is the premier film used in the waterproof, breathable roofing underlays in Europe.

The *Aptr*a films achieve their unique properties by utilizing patented polymer chemistry to create micro-voids within the film that allow water vapor to pass through,



Plant manager Don Ball using the SCADA computer system to monitor all aspects of the plant's equipment operation and performance.

but not liquid water. The film also is an excellent air barrier: *Aptr*a Classic and UV8 are two of the very few microporous films that pass the ASTM F1671, Viral Penetration Testing standard.

For all these cutting-edge, technologically groundbreaking develop-

ments at BI-AX, though, a large part of the company's business is still represented by the production of polypropylene films, which are considered to be much more a commodity product, rather than value-added specialty films that can fetch a premium price regardless of how a particular commodity is faring at any one point in time.

To ensure that the company's financial performance does not always fall prey to the perpetual pricing ups-and-downs plaguing the commodities business, BI-AX has gone through considerable efforts to optimize its production capabilities, while minimizing its labor costs, through extensive automation upgrades.

"We strive to make sure we are running the operation as lean as possible, so that we can be competitive with people around the world," Olejnik told *Canadian Packaging* during a recent trip to the Wingham plant, where a first-time visitor is immediately struck by just how relatively few people there are on the shop-floor during production. "We have to be competitive on a global basis when we're dealing with commodities.

"To augment that, we have to look at ways of bringing value to the marketplace, be it in terms of new products or competitive pricing," he says. "We want to be balanced between offering commodity-based products at a competitive price, and offering value-added products as well."

Adds general manager Tom Inglis: "The unique thing about BI-AX is that we probably have more manufacturing equipment here than any other [plastic films producer] in Canada right now."

As far as he is concerned, BI-AX is much better-served by employing a smaller, but more skilled workforce, with each individual employee being able to perform more manufacturing





After the stretched film leaves the transverse directional orienter, the entire sheet is scanned by the Honeywell Measurex scanner to ensure that it has obtained the proper gauge ratings throughout the entire roll.

One way in which the PCs keep on top of the line operation is by monitoring, or trending, all the

tasks and gradually becoming more knowledgeable on more aspects of the whole manufacturing process.

"Most of our people have to be fairly computer-literate: much more so than before," Inglis explains.

"They also have to have a understanding of the whole process, and that can only come with time."

Tom Inglis is quick to dismiss suggestions that such approach can conceivably jeopardize product quality by that fact that there are less eyes on the job, pointing to the extensive range of high-end, automated systems installed at BI-AX in recent years for close monitoring of all the various films produced at the plant throughout the entire production cycle.

A good case in point is the SCADA (Supervisory Control and Data Acquisition) computer system, installed in 1999, which monitors, in great detail, the entire 500-foot-long production line at the Wingham plant.

The SCADA at the Wingham plant is a hybrid system utilizing both PCs and PLCs (programmable logic controllers), with the PCs acting as foremen, of sorts, sending out work instruction and directions to the PLCs, which play the role of workers that actually operate the various drives on the production machinery.

electrical activity.

"That can alert us to a problem," explains plant manager Don Ball. "If a machine is using more electricity than usual, we can see that something is wrong."

Once the production line problem is detected and pinpointed, says Ball, the PLCs will shift the line into a "slow-down mode," until the problem is addressed and resolved.

The film-making process at BI-AX begins with placing the film onto a roll while in a molten state, after which is it passed on and cooled down by two other rolls to form a 50-mil-thick sheet of film, which is then directed to

the transverse directional orienter (TDO). The film is stretched even further in the TDO, with its thickness dropping down to one mil or less, and it is at this stage where the film is processed to obtain its specified clarity, strength and barrier properties.

Quality control also comes into play at this point. The film is scanned by a **Honeywell** Measurex model scanner, the purpose of which is to ensure the film is consistently the proper gauge, and the **Stahlkotner** winder then splits the roll in half for better and easier handling. The line is equipped with two slitters: a **Kamph** model slitler for specialty work, and

Valmet's Atlas model slitler for the rest, which operates in the range from seven to 60 inches.

Because BI-AX is well aware that automation alone can only take quality control so far, before every roll is actually shipped out of the facility it is taken to the plant's laboratory, to be subjected to the meticulous scrutiny of lab manager Rob Teschke.

"We test every roll here," states Teschke. "We check for tensile strength and for critical points such as gauge, gloss and COF (co-efficient of friction)," which is essentially used to determine how slippery the film is and, consequently, how well it will run on a client's particular piece of machinery.

The critical information obtained at the lab level is then entered onto the database and compared to spec sheets that are already in place, after which the so-called "C of A," or certificate of analysis, is generated.

According to Inglis, the BI-AX operation has achieved "a high point of traceability," so that should a problem arise with any of the company's product after it's been shipped, it can be traced back to its exact point of production.

All in all, the Wingham operation has certainly become much more technically proficient since it originally came on-line in 1988, as have the demands and expectations of its customers.

"The customers' demands are becoming much more technical," Dave Inglis observes, "and I also think the customers today are looking to their suppliers to provide more help than they did back in 1988."

At the end of the day, Inglis sums up, companies like BI-AX can only succeed in the long terms by consistently giving their customers exactly what they want.

"Our plan, basically, is to approach each customer individually," Inglis states, "and attempt to supply them with the product that is best tailored to fit their needs." □



Lab manager Rob Teschke checking the finished rolls of film for tensile strength, gauge, gloss and co-efficient of friction.



Into Packaging Film

Every few years, science and technology provide us with a product that requires us to stand up and take notice. Now packaging films have their new crusader. Your customers expect environmentally responsible packaging. As stewards of their products, you need to be aware of new technologies. Now BI-AX has developed a packaging film that is derived from an annually renewable resource. Evlon® film from NatureWorks™ PLA offers properties such as excellent deadfold, high clarity and gloss, flavour and aroma barrier, high stiffness with the added benefit of being 100% COMPOSTABLE! Now you have a choice... "plastic" with a conscience.

Call Michael Olejnik at 519-357-1818 or email evlon@biaxinc.com for more information on how you can use corn based packaging film in your packaging needs.

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