COATING & CONVERTING
SPECIALISED MAGAZINE FOR THE COATING AND CONVERTING INDUSTRY

European paper, film and foil converting

DRIVING PROFITS HOME WITH LEADING EDGE TECHNOLOGY
FIGHTING THE INVISIBLE ENEMY KEEPING STATIC UNDER CONTROL
THE PERFECT UNION A BOND FOR EVERY PURPOSE

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Converter of the month: Elopak in Holland (p. 50)
We offer a change of scene in our Converter of the Month series as we head to the Dutch/Belgian border, on to the Dutch industrial port of Terneuzen and home of one of the major production sites of coater and carton converter Elopak. C2 visited plant manager Jeroen Rijnhout and coating director Erik Voet of specialist coating sister company Elocoat.

The Elocoat printing and carton converting plant is just a five minute drive from Oseloweg, home of Elocoat and site of a single coating line which produces coated PE and barrier board for dairy and aseptic liquid packaging. The street name bearing the name of the Norwegian capital is no coincidence because the Elopak group is headquartered but no longer manufactures there.

Elopak is 100% owned by the FERD Group, one of Norway’s largest privately owned industrial groups. In total the group employs 2000 people in the Netherlands with other Elopak European plants in Speyer (Germany), Århus (Denmark), Fastiv (Ukraine) and Belgrade (Serbia). All other European plants are specialized in converting and flame sealing. The plants in Ukraine, Saudi Arabia and Mexico have a combination of coating, converting and flame sealing. This makes Elocoat in Terneuzen the true coating specialist of the Elopak group.

The site of Terneuzen has some obvious advantages in terms of logistics and location. It is a port in the North Sea in the heart of the rich Northern EU countries, close to other converter plants and with plenty of space for warehousing as well as transporting goods by sea. Terneuzen is also home to a number of other multinational plants such as Dow, which is a major supplier of PE used in barrier board. Paper board rolls from suppliers such as Stora Enso come as a rule by sea.

**History**

The story of Elopak began in 1957 when the company was granted the rights to the European Pure-Pak brand, first operating as a licensee before buying the rights. In terms of production capabilities the company bought coated board externally until 1983 when the first own coating production facilities were initiated. Production began in 1984, so last year Elocoat celebrated its 25th anniversary. Aluminium barrier production dates back to 1986.

“"The reason Elopak started its own coating was simply to become less dependent on external suppliers of coated board," explains Rijnhout. "The plant produces 100% liquid packaging board for use within the group, of which 40% is PE board for fresh milk products and 60% barrier board for aseptic fruit juices."

“Of course the big advantage of producing extensively for the same customer, and that customer being part of the same group, is that marketing and selling the product becomes the responsibility of the customer which has contact with the free market. It also means that we cannot afford to make any mistakes because, if we do, we not only harm ourselves but our sister company too.”

Elocoat’s output has grown from 115 000t a year in 2003 to 155 000t a year in 2009 and this is set to rise to 170 000t by this summer. Of the 95 employees 53 are in production, 11 in maintenance, eight in quality control and three in engineering.

The focus of activity since 1984 has been a sole coating line and, by using five shifts, the company continues to keep production going 365 days a year. As much as 70-80% of the production is set up for 1-litre cartons, with some 0.5, 0.75 and
even 1.1-litre cartons also produced.

Bulk sizes from 2-5 litres are also produced for bakeries and catering.

Some two thirds of the coated board is transferred to the neighbouring Elopak converting plant in Terneuzen. About a quarter goes to Elopak Speyer and the rest to other Elopak plants in Europe. Overall, only 10% of the coated board converted in Elopak plants comes from external sources. The manufacturing capability is structured into departments for production, maintenance, logistics/planning and quality assurance. This is supported by five teams and separate teams of rewind and core handling operators who work on a different shift schedule to the main production teams to ensure efficient and smooth running of the extrusion coating line on a 24/7 basis.

Sole coater

The ER-WE-PA (Davis-Standard) extrusion coating line dates back to 1984 but looks little like the original because so much has been added and modified over the years. The line is 2.75m wide and 60m long. It runs at 500m/min. It has three stations with a total of eight extruders, double the original four. Five extruders are 6in each in diameter, two are 8in and one 4.5in. A bulk truck of PE is required every two to three hours.

Dairy products are the main end user market for Elocoat materials

Readers of this magazine may be surprised to discover that such a major coating plant has just one line. “We have always believed that our line is state-of-the-art and we invest to make sure it is that way,” explains Voet. “Therefore there is no need to have a second line.”

A new roll is loaded onto the unwind of the 60m ER-WE-PA extrusion coating line

Four operators are required to run the coating line, five for barrier board and two for the rewinder. A reel takes six to seven minutes to be processed as the base weight is between 240 and 370gsm. A finished reel weighs between 12 and 13t. Inline moisture measurement and laser diameter

Rijnhout has been plant manager since January 2009. He joined the company in May 2006 as plant engineer and became production & engineering manager in December 2006. A bachelor of analytical chemistry, Rijnhout previously worked for Basell Polyolefins.
Offline test and measurement takes place in an environment with controlled temperature and humidity. Measurement are fixed on the line. The coated jumbo rolls can be slit in-line with circular knives into three smaller rolls for further converting outside the plant. Overcoat is removed using an exhaust system.

**Major investments**

In 2008 €4M were invested in upgrading the line. An 8in extruder was installed on station three and a corona station was added in preparation for printing at Elopak. A dual inspection system for both sides of the web with red LED enables defect detection of impurities such as holes and dirt (see box for further details of this investment). A new vacuum crane and heating control, as well as two new silos, rounded off the 2008 investment programme.

On visiting the plant, C2 witnessed Elocoat in the midst of a two-year €6.5M investment in new technology planned for 2009/2010. The first phase in 2009 involved a new aluminium unwind on the drive side. This 2m wide unit from Kroenert is installed in the middle of the line with its own access point.

Currently, Elocoat is in the process of replacing the flying splice system with a new butt splice unwind and roll transport from Spanish supplier mTorres. A new flame pre-treater has been supplied by Aerogen and an additional extruder is being installed on station 1. Finally, the supply side software is being replaced and a new sprinkler system

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**INLINE INSPECTION**

Inspection of the bottom side on a stabilisation roller with red Chip on Board high power LEDs

A total of four high speed FSP600 web inspection systems from German supplier Optical Control Systems are installed on the Elocoat line. Two 160MHz high speed cameras (36 000 scans/sec) inspect the 2800mm web width on the top side and two on the bottom side. Each is installed on a stabilisation roller before and after the corona treater and control 100% of the web width. The different types of defects, such as fish eyes, insects, gels, black specks, coating voids, PE lumps, holes, streaks, creases, wrinkles, scratches and splices can be found automatically and distinguished from each other.

High power red chip on board LEDs enable a resolution of 240µm at 500m/min in machine direction and 350µm in cross direction. These sophisticated LEDs have a special focus lens, passive cooling management (no water or air cooling) and a tight screen of 0.7mm. This enables a high light intensity for high resolutions up to 25µm and speeds up to 1000m/min.

The inspection result of the two camera beams is analysed on one rolling map and the offline analysis software enables Elocoat to eliminate critical defects later on the roll doctor. The whole system is integrated into the Elocoat network so that the inspection system can be controlled from various PCs (and also from OCS via remote access if necessary).

All the inspection data is available offline within the network. Offline analysis software enables Elocoat to reanalyse and reclasify reels and eliminate critical defects on a roll doctor. In addition, the quality of a weekly or monthly production campaign can be analysed.
installed for increased security. In addition to major investments, there is a culture within Elocoat for continuous improvement. “We are always trying to be better by thinking smarter,” Voet explains. “Small improvement projects such as de-bottle-necking can be as valuable as a big investment. Seemingly simple things, such as a new splicing tape developed by tesa, have saved us hundreds of thousands of Euros.”

Amongst the small pieces of machinery in the factory there is a core cutter and an offline rewinder or ‘doctor machine’ for processing imperfect rolls.

R+D on production line

Most converters have a smaller pilot line to carry out trials but Elocoat has come up with a completely different solution. “We used to use the pilot lines of our polymer suppliers for trial purposes,” Voet explains, “but this was not ideal because of the need for pre-treatment.”

“Here we have everything so we decided to do trials on the production line in between jobs and have found that this works fine. We have one station outside the line for polymer trials. On average we do some R+D work once a week.”

Indeed, on C2’s visit the line was running a trial substrate at 400m/min.

Offline testing

A new laboratory has just opened with a range of offline test and measurement equipment for friction and smoothness testing, layer curling, seal testing and much more. The room is acclimatised at 23°C and 50% humidity.

A separate chemical laboratory has been set up for a dozen or so important tests to be carried out on the quality of raw materials and on properties such as the melt index and online coat weight. The Elocoat plant is ISO 9000 and FDA compliant and plans to pass BFC certification this year.

“We are going after the prime market segments,” adds Voet who explains that the Elopak name stands for quality. “So it is essential that we maintain our high standards.” Undoubtedly, the policy of continuous improvement has put him and Elocoat in the best position to achieve these goals.

Day-to-day operation of the line takes place in a soundproofed room using state-of-the-art management software and process control systems.