

## Mill story

Količevo Karton, PM3, Slovenia

# Gathering impressions

## Ljubljana and Domžale

Archaeological finds indicate that the Domžale area has been settled since prehistoric times.

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▲ The Ljubljana Marshes are a unique natural area of wetlands and peat bogs well known for its rare animal and plant species and the remains of a prehistoric pile-dwelling culture (UNESCO World Heritage Site).

Besides having everything that all the other modern capitals have, Slovenia's capital Ljubljana succeeded in maintaining the relaxed atmosphere of a small city. This picturesque and very vibrant city is full of surprises. The region, which comprises 25 other municipalities besides Ljubljana, is noted for its traditional hospitality, diverse countryside, nice towns, castles, quality traditional restaurants, and village churches with their rich legacy of fine arts.



▲ View of Slovenia's capital Ljubljana with the Kamnik Alps in the background, © Miran Rebrec.

Industry remains the most important employer, notably in the pharmaceutical, petrochemical, and food processing industries. Other fields include banking, finance, transport, construction, skilled trades and services, and tourism. The public sector provides jobs in education, culture, health care, and local administration. The Ljubljana Stock Exchange (Ljubljanska borza), purchased in 2008 by the Vienna Stock Exchange, deals with large Slovenian com-



▲ By the 19<sup>th</sup> century, Domžale had already become the European center of the straw hat industry.

panies. Some of these have their headquarters in the capital: for example, the retail chain Mercator, the oil company Petrol d.d., and the telecommunications concern Telekom Slovenije. Over 15,000 enterprises operate in the city, most of them in the tertiary sector.

Central Slovenia is where the alpine and karst landscapes meet. Thus, various unique natural and cultural features were created. These include the Ljubljana Marshes, an area of wetlands and peat bogs known for their prehistoric pile dwellers and for their rare animal and plant species, the high mountain plateau Velika planina situated in the Kamnik Alps, noted for its ski center and for being the oldest dairy herdsman's settlement in Europe, interesting subterranean caves, karstic fields, and the mysterious forests of the Polhov Gradec and Posavje hills that abound with farms

offering holiday accommodation. Most of the surrounding villages were built in the 14<sup>th</sup> century, when a large number of water-powered flour and sawmills and several iron smelting works began to operate in the area. In the 19<sup>th</sup> century, the area's ancient industries gave way to a handicraft



▲ Krumperk Castle, close to Domžale.

#### Domžale - key facts:

- Inhabitants: approx. 13,037
- Size: 72.3 km<sup>2</sup>
- Main industries: paper and board production, handicrafts

for which Domžale became renowned: the making of plaited straw hats.

The town of Domžale was established in 1925, when two small towns were merged into one. Since 1952, when it was designated a city, it has undergone rapid development and grown into one of the country's best developed and most densely populated areas.

Domžale's surrounding area is scattered with picturesque hamlets preserving distinctive cultural features and offering ample opportunities for hiking.

# Količevo Karton

## The specialist for all kinds of packaging

The Mary-Melnhof Karton production site combines state-of-the-art technology with long-term experience with packaging grades.



▲ The mill after its foundation in 1920 and today.

### Packaging specialist

The recycled and virgin fiber-based cartonboard grades produced at the Količevo mill are characterized by consistently high quality and application safety. The mill specializes in the production of grammages between 200 and 500 g/m<sup>2</sup>, which are mainly used in food, cosmetics, and pharmaceutical packaging, and in other high-quality applications.

### Tradition and innovation

Strategically located between the Eastern and Western European markets, the Količevo mill, founded in 1920, produces virgin fiber and recycled fiber-based cartonboard. This Mayr-Melnhof Karton production site optimally combines state-of-the-art technology and processes with the expert knowledge, motivation, and dedication of its employees. The result: high-quality folding cartonboard and satisfied customers.



### Environment and society

At the Količevo mill, environmental protection is an important priority and has been an integral part of the company's corporate culture and policy for many years. While environmental awareness is consistently being developed and encouraged in all areas, measures to protect the environment are not limited to production alone; they also cover both upstream and downstream areas of the supply chain, including purchasing and logistics. With respect to the environment and sustainability, the concerns of customers, employees, suppliers, and residents are already taken into consideration during the planning stage of all projects.

▲ The recycled cartonboard production is of utmost importance at the mill.

# Challenge accepted

## New hybrid former development for Količevo

The most prominent feature of the new hybrid former *PrimeForm* HB: It is incredibly small (half as tall as a conventional former) and has only three rolls.

Paper properties are strongly influenced by the spatial distribution of the raw materials in the sheet. The design of the ANDRITZ *PrimeForm* HB hybrid former in combination with the *PrimeFlow* headbox delivers excellent paper quality and paper uniformity.

### High-speed solution

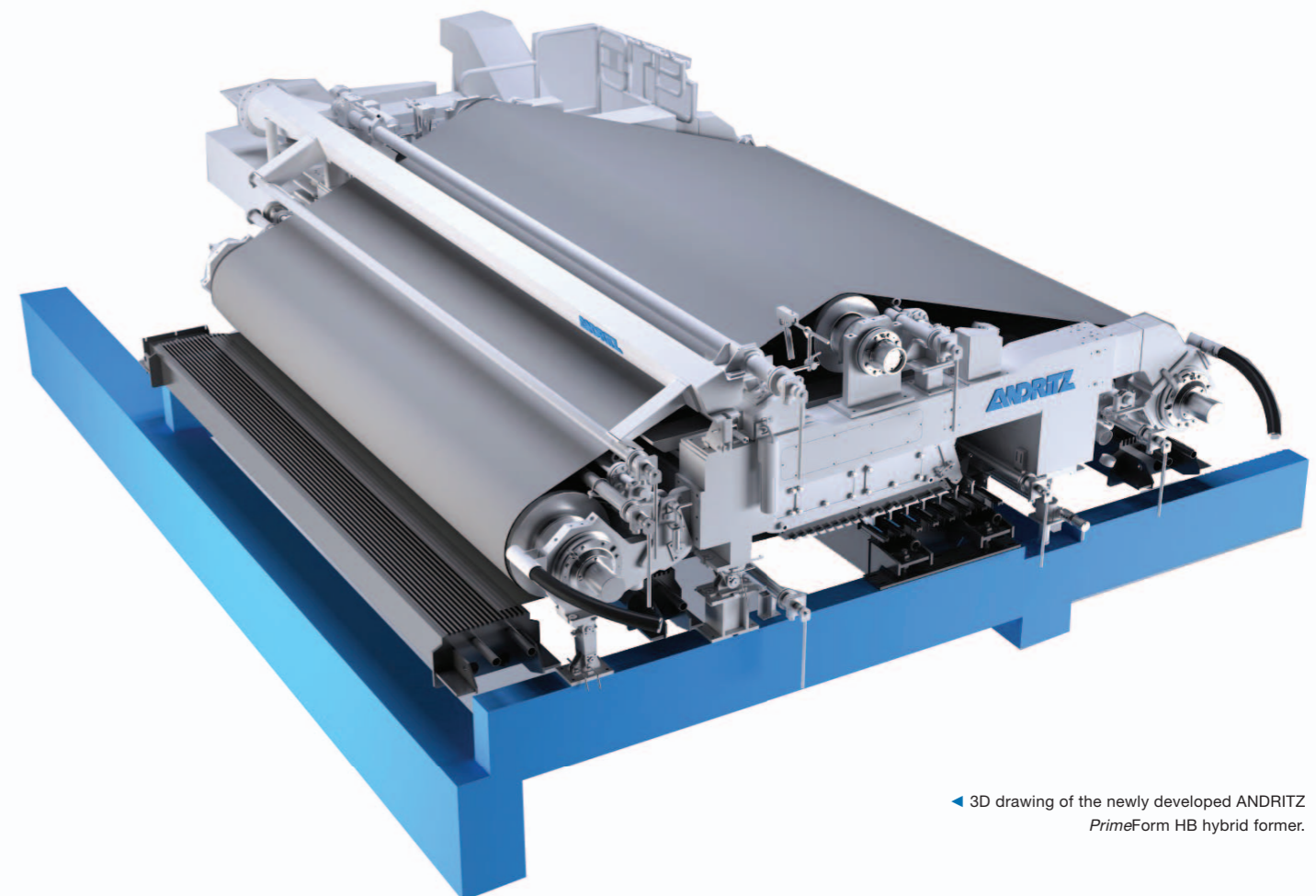
The *PrimeForm* HB is a state-of-the-art hybrid former, designed for an operating speed of up to 1,200 m/min. It provides full operational flexibility and optimized handling.

### Benefits

- State-of-the-art sheet forming, allowing for high production capacity and paper quality
- Compact, efficient design
- Operator requirements for safe handling, cleaning, and maintenance are built in
- Fully cantilevered frame for efficient wire change

### Perfect sheet quality

A Fourdrinier section equipped with a hybrid former has a far higher drainage capacity and yields significant beneficial effects on the sheet quality (e.g. improved formation and improved z-direction distribution of fines and filler).



▲ 3D drawing of the newly developed ANDRITZ *PrimeForm* HB hybrid former.

# Half-high hybrid former brings precision to Količevo

Within a span of 10 months, ANDRITZ developed, designed, and delivered a new, three-layer Fourdrinier wet section with a new type of hybrid former for PM3 at Količevo Karton. As part of the project, ANDRITZ also rebuilt the complete wet end.



*“First to market gets the business. That explains our tight time schedule.”*

Rado Kunavar  
Technical Manager  
Količevo Karton

## The PM3

PM3, the machine to be rebuilt, was installed in 1979 by ANDRITZ. It has a trim width of 4.5 m and had eight vacuum formers for grades ranging from 210 up to 500 g/m<sup>2</sup>. Before the rebuild, it was producing testliner – a useful commodity grade with small growth potential.

## The PM2

On the other hand, Količevo’s PM2 is producing KROMOPAK folding boxboard, a virgin fiber-based grade with a three-layered coating. KROMOPAK is what Mayr-Melnhof calls a “GC2” paperboard, a surface pigment-coated folding boxboard. It is in high demand for packaging perfumes, pharmaceuticals, cigarettes,

consumer goods, and foods (due to its virgin fiber content). “The advantage of our KROMOPAK is its high smoothness,” says Kunavar. “It has excellent printing properties with intense color rendering.”

(Left to right): Barbara Freyler, ANDRITZ Project Manager; Rado Kunavar, Technical Manager at Količevo Karton; and Wilhelm Mausser, ANDRITZ Head of Design Development, in front of the rebuilt wet end. ▼



## A major challenge

Everyone knew it from the beginning: the designers, the engineers, the customer, and the project team. This was going to be a major challenge.

The task was to install a new wet end on PM3 at this Slovenian mill and incorporate a new-design hybrid former – in only ten months. This is another practical example of when people at ANDRITZ say, “We accept the challenge!”

In the end, they made it: quick, short, and precise. According to Barbara Freyler, ANDRITZ Project Manager, the contract was signed in February 2011. On the 29<sup>th</sup> of December, two days before the contract deadline, the machine was started up.

## Christmas present

“Not a bad Christmas present,” says Rado Kunavar, Technical Manager at Količevo Karton. “For me, it was the largest project I have been responsible for in this company. It was great to have ANDRITZ as our partner. The cooperation was excellent. I actually expected much more stress!”

## A demand for GC2

The Količevo mill has been in existence since 1924 and was acquired by Mayr-Melnhof Karton of Austria in 1998. Mayr-Melnhof is the world leader in recycled coated board.



▲ The task was to completely rebuild the wet end on Količevo's PM3 – including a new design hybrid former so it could produce a premium grade of board; in only 10 months from design to start-up.



▲ Adding the new PrimeForm HB hybrid former for the filler layer enabled the correct level of dewatering and improved formation.



▲ ANDRITZ succeeded in executing the wet end rebuild in only 26 days. The existing cylinder mold formers on PM3 were replaced with a three-layer fourdrinier (PrimeForm SW), which included three new PrimeFlow SW headboxes. The PrimeForm HB is utilized for filler layer dewatering. The existing press section was upgraded with a pick-up roll to allow a closed web run to the press section.

With the demand for GC2 growing fast, Kunavar says that the mill decided to rebuild PM3 to produce these grades. "The first to market gets the business, so we wanted to do it quickly," he says explaining the time schedule. "That is why we turned to ANDRITZ."

### Rethinking the former

To produce the required quality for GC2, the conventional vacuum formers on PM3 would have to be replaced by a Fourdrinier wet section. According to Freyler, adding a hybrid former was the right solution since it would enable a higher level of dewatering.

"It turns out that Količevo's timing was right," Freyler says. "We had an active development program to rethink the design of hybrid formers on retrofits of Fourdrinier machines. In addition to boosting dewatering capacity, our designers were working on solutions to improve the sheet quality – with symmetrical dewatering to improve the two-sidedness of the sheet, more equal Z-direction distribution of fines and fillers, and improved formation." But there was only one problem. The machine hall at the

mill was not tall enough for ANDRITZ's conventional hybrid former. Next challenge: cut the height of the former in half.

Problem solved. ANDRITZ engineers developed a completely new type of hybrid former, the PrimeForm HB, to meet the requirements at Količevo. "Our thinking is that there are probably other installations that will have this same space limitation so it would be a good idea to have this design," Wilhelm Mausser, ANDRITZ Head of Design Development says.

### The PrimeForm HB

The PrimeForm HB on PM3 is now one of the smallest in the world. But in this case, small is mighty in that it performs precisely to specifications, according to Kunavar. "In terms of dewatering, the incoming consistency of 1.5-2.5% is increased to 6-13% coming out of the former," he says. "We are seeing a much improved formation index and the paper tests show very good burst, crush, and bond strength.

The former has three rolls that can be adjusted on-the-fly and a design where each

foil can be loaded individually to tailor the pressure pulses exactly to production requirements. The foils are ceramic. Tests have shown the ceramic foils to be superior in terms of wear-resistance, surface finish, and forming fabric life. It is a very clean-running unit. There are enclosed doctor pans. Maintenance is easy because the top forming unit can be lifted up. There is direct access to all the ceramic foil covers and the skimmer channel.

### Wet end improvements

The existing cylinder mold formers on PM3 were replaced with a three-layer Fourdrinier (PrimeForm SW), which included three new PrimeFlow SW headboxes. A dilution control system was installed for the filler layer. The PrimeForm HB is utilized for the filler layer dewatering. The existing press section was upgraded with a pick-up roll to allow a closed web run to the press section.

ANDRITZ succeeded in executing the wet end rebuild, thanks to precise planning, in only 26 days. "On December 29<sup>th</sup> at exactly 8.15 pm we put paper on the reel," Kunavar says. "Forty minutes later, the

first reel turn-up occurred without a sheet break. It truly was a masterful job of planning and execution." "We reduced the time on-site by pre-erecting the complete wet end equipment at our workshop in Graz," says Freyler. "The team from Količevo drove to Graz for final inspection. Then we transported the equipment to the mill to erect it on-site." Unfortunately, the last step occurred right at Christmas time. "We had a short holiday," Freyler and Kunavar say. "Work stopped for Christmas Eve, but on the 25<sup>th</sup> of December, we were back working at the mill."

"ANDRITZ has been very flexible and open-minded during this whole project," Kunavar says. "The project has come up all our expectations."

The rebuilt machine is now producing GC2 grades at a speed of about 460 m/min, which is the same speed as before the rebuild. "We have not increased the speed yet because we want to fine-tune the sheet," he says. "But our aim is to ramp up to 800 m/min in the near future."

*"We finished two days before the deadline. It was a nice Christmas present for the mill."*

Barbara Freyler  
Project Manager  
ANDRITZ



# A ready market

## Production of two European top brands

Highest gloss, impressive smoothness, and a high degree of brightness: The two GC2 qualities, Kromopak™ and Excellent Top™, combine competitiveness and responsibility.

Količevo is finding a ready market for its KROMOPAK from PM3. The standard product is a high-quality, blue-white board with 38 g/m<sup>2</sup> woodfree top and bottom and a 100 g/m<sup>2</sup> filler layer. The top is triple-coated and the bottom is coated once. The machine is also producing a new product (Excellent Top), which is a yellow-white board using a 50/50 mix of hardwood and softwood pulps. Here are more details about these two European top brands:

### Kromopak™

Kromopak™ combines a bright, attractive look with excellent economic and environmental performance: Eco-friendly use of high-quality recovered paper (post-industrial fibers, wood-free, unprinted white paper only) together with certified wood pulp allows us to make a significant contribution to meeting sustainability goals and adds convincing environmental values to Kromopak™.

Kromopak™ is in high demand for cosmetics and fragrances, personal care and pharmaceuticals, graphical applications, and food.

Kromopak™ is available in the grammages 200-400 gsm, with FSC® or PEFC™ certification, and can be ordered with a halal certificate.

### Excellent Top™

MM Karton's established Multi-Mill concept now also applies to virgin fiber-based board. Since January 2012, the well-known and widely used GC2 cartonboard Excellent Top™ is being produced not only in Baidersbronn, Germany, but also in Količevo, Slovenia.

### Additional production site: gains in supply security, and flexibility

With the gradual expansion of the Multi-Mill concept, Mayr-Melnhof Karton meets a major market requirement - consistent quality and high supply security combined with short lead times. The perfect location of both mills in the center of Europe guarantees flexible service and shortest transportation routes. Excellent Top™ can be produced in even larger quantities. Thus food manufacturing, pharmaceutical, and health care companies, the cosmetics industry, and also converters can rely even more on the high supply security and MM Karton complements its leading position in WLC qualities with a significantly growing share of FBB business. Excellent Top™ convinces with good printability and consistent high quality. Excellent Top™ is available in the grammages 215-450 gsm, with FSC or PEFC certification.



Type					
Excellent Top	EXCT	GC2	12100		215-400
Kromopak	KRO	GC2	12172		200-400
Belpak	BEL	GT2	32173		230-450
Grafopak Kraft	GRK	GT4	34101		300-500
Grafopak	GRA	GD2	42134		250-450
Multicolor Special	MCS	GD8	43131		230-450
MM-Liner	MML	LIN	44103		210-250

▲ Qualities produced at the mill



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