



PAPERMASTER

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Process efficiency in XXL format

Demag integrated solution in base paper production



Top quality and high-speed handling

PM2, which is the highest-capacity paper machine in the world, has been producing corrugated cardboard base paper 10.20 m wide since March 2010. Testliner papers and corrugating medium with a weight of 70 to 130 g/m² are made on the basis of completely recycled paper at the new mill in Eisenhüttenstadt.

The prime objective is for the facility to take advantage of its maximum capacity as soon as possible. Then, the reels will be filled with 1,800 metres of base paper every minute.

Maximum performance at world-class level

Only eight months after it entered service, PM2 achieved a production world record for 90 g/m² weights in non-stop 24-hour operation. In April 2011 the plant broke another world record: an 80 g/m² corrugating medium continuously emerged from the machine at 1,650 m/min for 30 hours.

Cranes for efficient logistics

High production output calls for reliable materials handling systems that require logistically smooth and efficient handling at every stage through to shipping. For this purpose Demag Cranes & Components delivered all the crane systems for the paper mill and roll stores and linked production and logistics with a warehouse management system.

Demag cranes play a leading role wherever parts of machinery need to be transported safely, reels are lifted in the same cycle as the paper machine and rolls of paper are carefully placed into storage.

Propapier, Eisenhüttenstadt

World-class format production

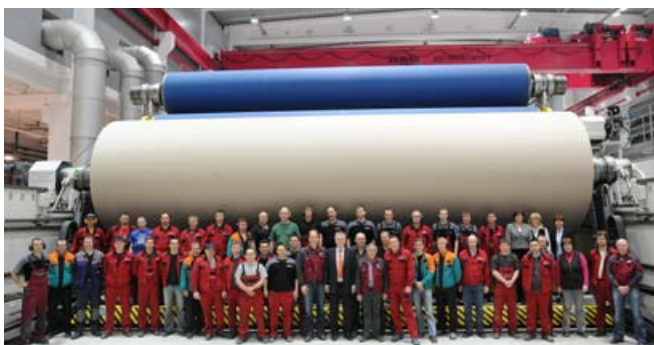


Packaging demand is increasing worldwide

Two thirds of all goods in Germany are packed in corrugated cardboard. No matter whether they are shipped to trade and industry or sent by online mail-order, the need for corrugated cardboard is constantly on the increase worldwide. The demand for low-cost, lightweight and dimensionally stable packaging is growing continuously.

Paper and format production in equilibrium

Under the umbrella of Progroup AG the Propapier company produces corrugated cardboard base papers which its sister company Prowell processes to make corrugated cardboard formats. The strategy of self-reliance on base papers was thrown off course by the launch of four new corrugated cardboard facilities. Paper machine PM1 in Burg near Magdeburg on its own was no longer able to supply the new locations in Germany, Britain and Poland independently.



1,800 m/min at a width of 10.20 m: paper machine PM2 operates at world-record speed

By investing in a paper mill in Eisenhüttenstadt, close to the Polish border, Progroup will continue to operate on an independent and flexible basis in future. After all, with the new paper machine PM2 it will soon have access to an additional annual production of 650,000 tonnes of base paper.

PM2: Demag cranes in production and maintenance



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Demag cranes involved right from the beginning

At an early stage, when the paper machine was being set up, Demag Cranes & Components ensured safe and swift transport of loads. Cranes were equipped with up to five hoist units so the parts of machinery were positioned for assembly of PM2 reliably and accurately.

Two cranes for safe handling at the paper machine

Above the wet end there are hoist units with load capacities of 130/65/65 tonnes. As a result, the rollers and all the machine components can be lifted and transported with precision for maintenance and repair.

Especially in day-to-day business, quality only counts if the speed is right. In time with the machine, the crane installation above the dry end of PM2 handles the speedy return of the empty reels from the rewriter to the reel storage area. Master/slave mode ensures absolute synchronisation of the two 130-tonne and 90-tonne hoist units – and hence a high level of safety.

Rotating spreader for heavy loads

If required, this crane can also retrieve full reels temporarily. For this purpose a motor-driven rotating reel spreader is used, with which full reels weighing up to 160 tonnes are lifted and set down parallel to the paper machine.



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Demag process crane with motor-driven rotating reel spreader

Working on two levels

A third crane installation, which is used above stock preparation, operates on the same runway. With two 40-tonne winch units at each level it handles the machinery components required for this production process. The lifting height specification makes it possible to transport components through an opening in the floor from the inward delivery level located underneath.

Integrated flexibility

These three crane installations are provided with extra flexibility by two more hoist units, to be prepared for all repair and maintenance jobs. On each crane, two rope hoists from the DR-Pro range run along the crane girders in the form of cantilever crabs. Owing to their compact design and fast lifting speeds they are used to install and remove parts of machinery weighing up to 10 tonnes.

Jürgen Heindl, CEO, Progroup AG:

“On account of the positive experience with our PM1 and the resulting collaboration in complete confidence, for the major project PM2 we also opted for Demag Cranes & Components. Here again, our supplier was able to convince us with sound consultation, sophisticated crane technologies and reliable project management.”

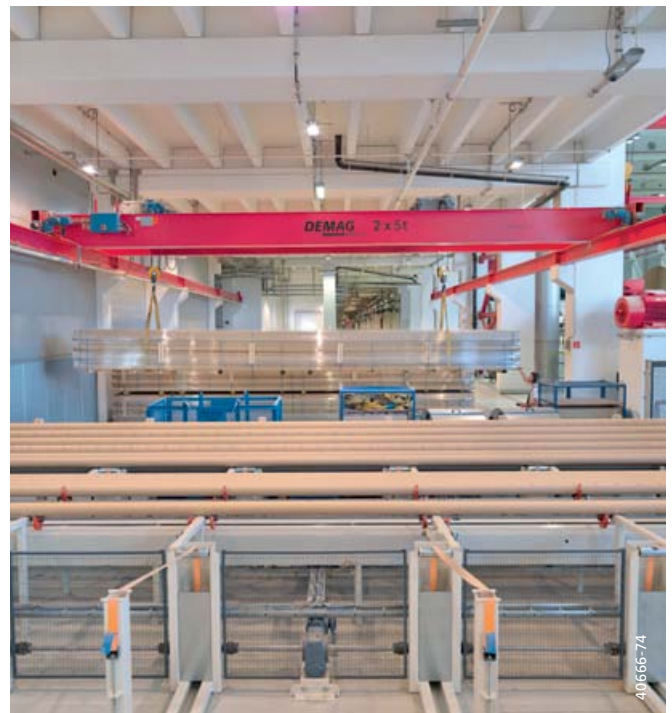
Demag crane engineering for the entire paper mill

At the other production and service stations of PM2 as well the owner, Propapier, opts for proven Demag crane engineering. The cranes assist plant personnel with maintenance of the vacuum system, with ultrafiltration and with flocculants. Other cranes handle core packages and operate in mechanical workshops and adjacent areas.

Load handling at two operating levels:
Demag crane in stock preparation



Demag double-girder overhead travelling crane
with two hoists handles core packages



Economical and efficient storage

Stored efficiently – made available on time

The entire annual production of 650,000 tonnes is transported to the paper roll shipping store by the materials handling equipment. At the height level of PM2, three automated process cranes fitted with vacuum lifting devices ensure that unpacked rolls weighing up to 5,300 kg are gently placed into storage. The cranes stack the rolls in the form of towers in two bays up to a height of 17.50 m.

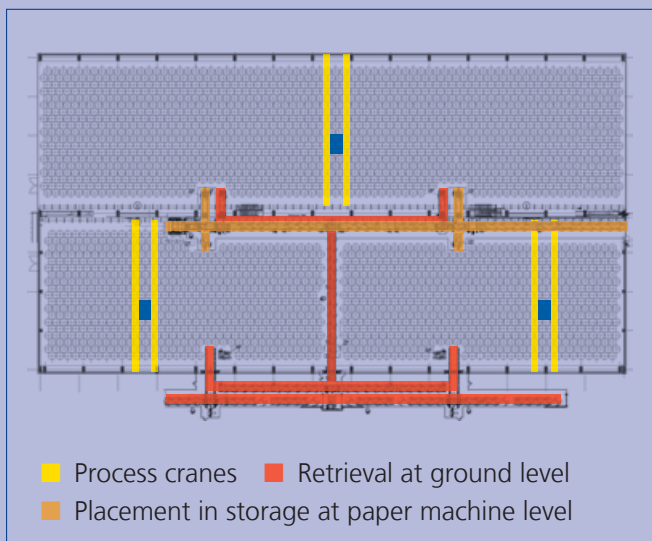
In each bay, two variable-size storage blocks are made up with different stacking grids for the roll diameters produced by Propapier up to 1,400 mm and 1,600 mm. Owing to efficient storage of the rolls in a honeycomb grid and vertical load pick-up by crane, the stacks of rolls can be positioned in a space-saving manner. That way the available space is utilised to the full. At a theoretical fill level of 80%, the store reaches a capacity of 42,000 tonnes.

For the retrieval operation, the cranes transfer the rolls of paper to conveyors at ground level. From there the rolls are transported direct to the truck loading zone.

The efficiency of the store is also increased by fast access times when loads are picked up and by the high travel speeds of the three automated cranes.

Benefits of the crane store at a glance:

- Optimum utilisation of available space
- High safety standards due to automated processes
- Gentle roll transport
- Efficient use of the entire roll
- Fast access times for just-in-time availability
- No operating costs for industrial trucks in the store
- Reduction of personnel costs
- Rapid return on investment



PM2 paper store installation layout



Gentle transport and storage: Demag crane engineering with vacuum technology

Software solutions made to measure



Individualised storage strategies

Since the components of the storage management software are modular, individualised storage strategies can be integrated into Propapier's customer processes. These are set up by plant personnel using visualisation masks at external terminals. They include, for example, the storage of single-type roll stacks and a multi-stage search for storage locations with optimised travel paths.

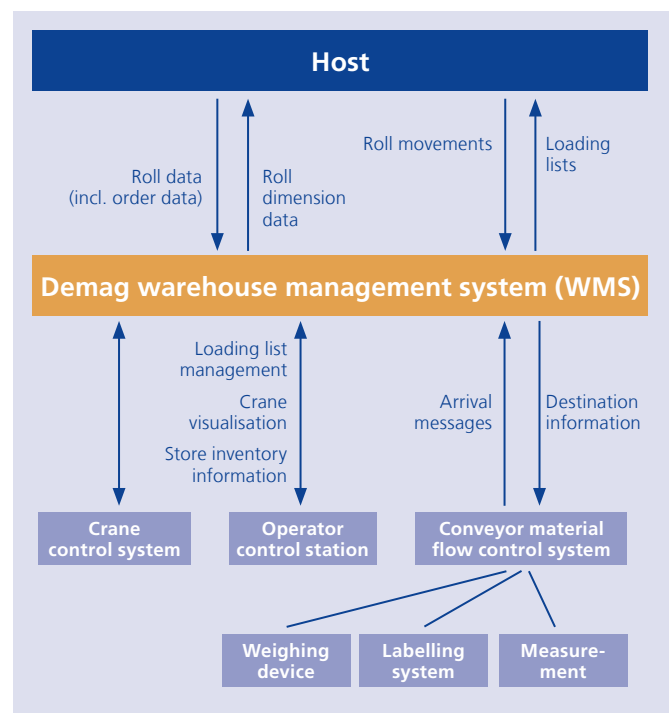
Three Demag overhead travelling cranes with vacuum lifting devices ensure safe roll transport throughout the store

All-in solution for storage and shipping

More than 100 rolls of paper are stored and retrieved per hour in peak periods at Eisenhüttenstadt. For this purpose the Demag warehouse management system (WMS) controls three process cranes. In addition, the WMS is linked to Propapier's "Wepaform" centralised management system. It communicates with the materials handling systems and numerous machinery components, and manages all the roll-specific data.

At external visualisation terminals the Demag WMS provides real-time information, e.g. about the installation operating status, and compiles a continuous inventory listing the storage locations. In addition, the system prepares the loading lists for shipping and controls the information displays for the truck drivers picking up cargo.

Demag warehouse management system with interface to the customer's host system



The comprehensive range of solutions for the paper industry

Demag Cranes & Components supplies customised crane installations for numerous industries all over the world. The paper industry is a key sector for which the company has unique industry-specific expertise to ensure efficient intralogistics processes in paper mills:

- Crane equipment for paper machines and related working areas
- Automated cranes and load handling systems for paper roll stores
- Planning of roll stores including the control systems
- Warehouse management systems with interface to customer's host computer

Based on numerous solutions for paper production lines all over the world and more than 35 fully automated paper roll stores implemented, an integrated concept was developed for Propapier's PM2 paper mill.

Full service for the paper industry

Demag Cranes & Components also offers comprehensive support throughout the lifecycle of crane installations with its range of services.

- Customisable maintenance and service agreements with 24-hour on-call standby
- Remote diagnosis and maintenance
- Highly specialised service pool for process cranes
- Worldwide spare parts service
- Comprehensive installation modernisation services

Technical data

Operating location	Crane type	Open winches			Rope hoists		Track gauge [mm]	Load handling attachments
		Load capacity [t]						
Paper machine								
Wet end	ZKKW	130	65	65	10	10	34,000	Balancer for changing rollers
Dry end	ZKKW	130	90		10	10	34,000	Motor-driven rotating reel spreader
Production processes								
Core handling	ZKKE				5	5	13,100	
Mechanical workshop	EKKE				12.5		19,200	
Stock preparation	ZKKW	40		40	10	10	34,000	
Auxiliary crane	ZKKE				16		13,100	
Basement crane	ZKKE				16		13,100	
Maintenance - vacuum system	ZKKE				16		8,070	
Maintenance - flocculant	ZKKE				3.2		8,070	
Maintenance - ultrafiltration	ZKKE				10		8,400	
Automatic paper-roll shipping store								
3 automatic cranes in bays 1 and 2	ZKKW	5.3					28,500	Vaccum lifting device for picking up rolls of paper vertically

ZKKW: Process crane with open winch units
 ZKKE: Standard double-girder overhead travelling crane
 EKKE: Standard single-girder overhead travelling crane

Demag Cranes & Components GmbH

Ruhrstrasse 28, 58300 Wetter, Germany

Phone: +49 (0) 2335 92-7784

Fax: +49 (0) 2335 92-7676

Email: info@demagcranes.com

www.demagcranes.com