



OptiLayer curtain coating station is very compact in size.

The Chinese premiere of curtain coated linerboard

TEXT Jouni Kempainen, Pauliina Purola and Marjaana Lehtinen

“Our customers want a low price but high quality. Curtain coating technology allows us to meet these requirements,” says **Shu Junming**, Vice General Manager, Ji’an Group Co, Ltd. The Ji’an mill, located in Haiyan County, Jiaying City in Zhejiang Province, China, has successfully reduced the need for virgin pulp in its coated white top liner production.

There were two options when the Ji’an Group was making a decision about the coating technology for its new Metso-supplied coated board production line PM 3. Option 1 was to go for traditional blade coating with two or three blade coating stations and the conventional way to produce coated white top liner. The three-ply base board would consist of a top ply of bleached kraft pulp, an under top of DIP and a bottom ply of OCC. Coating would be applied on white top base board. The quality of the coating layer was not a major issue because the base board would be white anyway.

However, option 2 presented a tempting – almost daring – alternative: Metso’s novel multiply OptiLayer curtain coating. It

would mean creating a totally new grade, curtain coated liner board for the Chinese market that would benefit both the mill and its customers. In this grade, there would be no, or significantly less, virgin fibers in the base board because white chemical pulp would not be needed in the top ply. The brown base board would be coated with blade coating, two-layer curtain coating and again with blade coating.

continued overleaf...

Shu Junming,
Vice General Manager.





Brown becomes totally white with curtain coating

The coating process and new grade was developed through successful cooperation between the Ji'an Group, Metso and Styron to get the most out of curtain coating. Styron is one of the leading companies that provides chemicals for the paper industry. Before the big decision was made, Ji'an, Metso and Styron ran a number of coating trials in Finland and Switzerland with both white and brown base board. Blade coating revealed a clear difference between the two bases. Whereas the white base board produced smooth and uniform brightness after coating, the surface of the brown base board showed clear mottling of brightness. In other words, the brown base partly showed through the coating layer made solely by blade coating.

“Feedback from the market has been positive, and orders for the new grade have been increasing. This is closely linked to our improvement in board quality.” says **Wen Xuefeng**, Mill Manager at Ji'an.

However, the simultaneous application of the two-layer curtain coating layers resulted in excellent and even coverage of the brown base board. And better yet, this curtain coated brown board had the same superior physical and printing properties as standard coated white top linerboard. The mill quickly recognized the cost savings potential of curtain coating, provided the amount of virgin fiber could be significantly reduced.

“The blade technology would have made it very difficult for us to be competitive in the market, since the biggest challenge in producing coated liner is its fiber cost. Our production line needs to be more capable and produce something unique. Being able to offer our

customers a better price will be our core advantage when competing with our competitors in the future,” points out Shu Junming. “Curtain coating technology will give us a cost saving advantage and also a wider selection of furnish such as AOCC and mixed office waste instead of white pulp. We will be able to supply a low-cost, high-quality product to the market.”

Clear cost savings achieved

Today, curtain coating is an integral part of the Metso-supplied containerboard line that started up at the Ji'an mill in November 2011. The 7.25-m-wide PM 3 is the world's fastest coated board machine with a design speed of 1,200 m/min. Its annual production capacity is approximately 475,000 tonnes of coated and uncoated white top testliner in the basis weight range of 130-280 g/m².

Since uniform-coverage curtain coating makes it possible to run PM 3 without expensive bleached fiber, the mill has been able to optimize raw material costs and thereby reach clear savings in production costs.

“The cost saving is estimated to be 200 RMB per produced paper tonne compared to conventional grade,” says **Wen Xuefeng**, Mill Manager at Ji'an. “Feedback from the market has been positive, and orders for the new grade have been increasing. This is closely linked to our improvement in board quality.”

At the moment, PM 3 produces about 50% coated and 50% uncoated linerboard. In the future, the target is to run about 70% of coated linerboard.

OptiLayer C curtain coating principle

In curtain coating, one to three coating layers are applied at the same time, thus the name multi-layer coating. It creates an even coating layer regardless of the base surface. By fine-tuning the functionalities of different layers in a cost-efficient way it is possible to customize the product's surface properties and improve its optical properties.

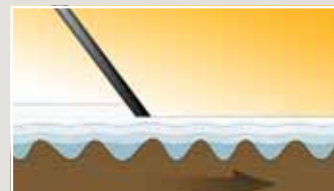
The application of coating layers within one station minimizes coating-related drying and space needs, which is especially important in rebuilds.



The first blade coating smooths the brown base board.



The two-layer curtain coating covers the brown base and increases brightness.



The second blade delivers the final smoothness and gloss for printing.



High physical and printing properties

Coating coverage as well as other physical and printing properties, such as brightness uniformity, smoothness and gloss, are on a high level with the curtain coating. The coating weight is approximately 30 grams in total.

“The appearance of the curtain coated board made from AOCC and OCC is the same

as that of white top coated liner made from bleached pulp when the coating formula has been adjusted correctly,” Xuefeng adds.

Multilayer curtain coating technology has demonstrated its capabilities to the satisfaction of Ji’an mill. According to **Li Congding**, Technical Manager, the overall performance and efficiency of the new coating line have been good.

“Metso’s technology support and its experienced experts have been very important. After all, most of our staff had never even touched a coating machine before. I appreciate all the knowledge and ideas about the new process that we have been provided. This will enable us to make good use of the curtain coating technology,” Shu Junming concludes. □



Mr. Li Congding Technical Manager of Ji’an Group.



Mr. Wen Xuefeng Mill Manager of Ji’an PM 3.

Wenwei Liu
Project Manager
Tel. +8615800333051
wenwei.liu@metso.com

Henri Vaittinen
Paper Technology Manager
Tel. +358 40 528 2048
henri.vaittinen@metso.com

Curtain coating benefits

- Production cost savings
- Each layer can be tuned for the desired property and cost
- Stable and even profiles, no need for adjustment
- Excellent runnability and efficiency
- Easy curtain width control
- Wide development possibilities in quality, production costs and raw materials



Li Congding and Wen Xuefeng from Ji’an and Metso’s Project Manager **Wenwei Liu** making sure everything works as planned.