Shanying and Valmet get closer through “Shared Journey Forward”

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Zhejiang Shanying Paper
Shanying and Valmet get closer through Shared Journey Forward

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Shanying International in brief and cooperation with Valmet in China
Shanying International in brief

- Shanying International is a listed company in China, about 10 thousand employees, head office in Shanghai.
- Shanying International and Valmet have over 12 years of cooperation:
  - The total capacity of Valmet supplied production lines has exceeded 3 million tons.

Manufacturing units and offices in the world
Zhejiang Shanying Paper introduction

- Zhejiang Shanying is the leading company in the city of Haiyan, near Hangzhou
  - Annual production of 1.6 million tons
  - Produces mainly test liner, fluting, white lined chipboard, and a coated liner with 100% recycled fiber.

- Long-term cooperation with Valmet.
- PM 13 is equipped with the latest technology, such as a curtain coater and third smooth shoe press.

<table>
<thead>
<tr>
<th>No.</th>
<th>Grade</th>
<th>Web width</th>
<th>Design speed</th>
<th>Supplier</th>
<th>Start up year</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM 11</td>
<td>Test liner</td>
<td>6,660 mm</td>
<td>1,100 m/min</td>
<td>Valmet</td>
<td>2008</td>
</tr>
<tr>
<td>PM12</td>
<td>Fluting and test liner</td>
<td>5,560 mm</td>
<td>900 m/min</td>
<td>Valmet</td>
<td>2006</td>
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<tr>
<td>PM 13</td>
<td>White top liner, coated liner</td>
<td>6,660 mm</td>
<td>1,200 m/min</td>
<td>Valmet</td>
<td>2011</td>
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<tr>
<td>PM 15</td>
<td>Core medium, fluting</td>
<td>5,560 mm</td>
<td>900 m/min</td>
<td>Local</td>
<td>2011</td>
</tr>
</tbody>
</table>
Anhui Shanying Paper introduction

Mainly high-quality containerboard and newsprint with 100% recycled fiber

- **PM 2**: Started as newsprint line but now mainly produces fluting with basis weight of 50-60 gsm
- **PM 5**: Thanks to excellent dewatering performance and good formation, PM 5 operating efficiency is very high
- **PM 6**: Equipped with gap forming and double-layer headbox, which significantly reduce wet end energy consumption

<table>
<thead>
<tr>
<th>No.</th>
<th>Grade</th>
<th>Web width (mm)</th>
<th>Design speed (m/min)</th>
<th>Supplier</th>
<th>Start up year</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM 1</td>
<td>Test liner</td>
<td>4,850</td>
<td>700</td>
<td>Local</td>
<td>2002</td>
</tr>
<tr>
<td>PM 2</td>
<td>Newsprint and low basis weight fluting</td>
<td>5,550</td>
<td>1,600</td>
<td>Valmet</td>
<td>2007</td>
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<tr>
<td>PM 3</td>
<td>Test liner, Fluting</td>
<td>5,800</td>
<td>900</td>
<td>Local</td>
<td>2009</td>
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<tr>
<td>PM 5</td>
<td>Test liner</td>
<td>7,920</td>
<td>1,200</td>
<td>Valmet</td>
<td>2014</td>
</tr>
<tr>
<td>PM 6</td>
<td>Fluting</td>
<td>7,920</td>
<td>1,700</td>
<td>Valmet</td>
<td>2014</td>
</tr>
</tbody>
</table>
Ongoing projects in Shanying Huazhong Paper
Jingzhou city, Hubei province

- Three production lines under construction
- PM 21 and PM 23, and also reject boilers will be delivered by Valmet
  - 8th and 9th board making lines from Valmet to Shanying International
- PM 23 is globally the 17th OptiConcept M production line delivered by Valmet
- These new production lines expect to reduce carbon emission as well as energy consumption

Shanying Huazhong PM 21 and PM 23

<table>
<thead>
<tr>
<th>No.</th>
<th>Grade</th>
<th>Web width</th>
<th>Design speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM 21</td>
<td>Test liner</td>
<td>7,920 mm</td>
<td>1,500 m/min</td>
</tr>
<tr>
<td>PM 23</td>
<td>Low basis weight fluting</td>
<td>7,920 mm</td>
<td>1,400 m/min</td>
</tr>
</tbody>
</table>
Shanying and Valmet shared roadmap forward
Shanying and Valmet get closer through their shared roadmap forward

- Develop the shared roadmap partnership together
  - Valmet is invited to join Shanying’s annual forum to introduce industry trends and the latest technologies
  - Yearly summit meeting is arranged to share information of industrial environment and corporate culture building

- Strengthen communication and develop innovative cooperation in Zhejiang Shanying

- Move big data management and applications forward in Anhui Shanying
  - Development of roll condition monitoring and grinding service agreement
  - Implementation of energy-saving agreement
  - Valmet Customer Portal to be in use

- Valmet Performance Center supports Huazhong Shanying start-up and optimization

Valmet is a reliable, long-term partner for us. The new cooperation model further deepens our mutual trust, and we are very satisfied with Valmet’s honest and responsible attitude.
Communications between Shanying and Valmet

Shanying International Annual Forum
- Started in 2017
- Purpose is to have all key stakeholders share info on technology, industry situation, etc.
- One and half day forum
- Valmet is invited to present the latest developments

Communications channels
- Yearly summit meeting
- Regular meeting for top management
- Valmet Mill Team and Shanying team quarterly review meetings
- Weekly visit by Valmet mill sales manager

Working model of Valmet Mill Team and Shanying team
Zhejiang Shanying Paper’s challenges
Zhejiang Shanying Paper’s challenges for further development

- “National Sword” on solid waste and new Environmental policy
- Company development and stakeholder expectations
  - Difficulty in new project investment approval
  - Yearly growth in production and probability
  - Labor costs, shortage, competence and Industrial Internet trends
- Production lines’ challenges and target for benchmark
“Shared Journey Forward” and result at Zhejiang Shanying
# Zhejiang Shanying PM13 development

Aiming to become the benchmark in the industry

<table>
<thead>
<tr>
<th>Machine efficiency</th>
<th>Energy saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aiming to reduce tail threading time from 55 min to 35 min</td>
<td>Aiming to make energy savings in stock preparation &gt; 20%</td>
</tr>
<tr>
<td>Achieved: Winder slitter change time from 1 min to 5-10 sec.; &gt; 95% less end customer complaints concerning dust issue</td>
<td>Achieving to make energy savings in paper production &gt; 15%</td>
</tr>
<tr>
<td>&gt; 95% less end customer complaints concerning dust issue</td>
<td>Achieved: Steam saving more than 20% in coating sections</td>
</tr>
</tbody>
</table>

ü **Machine efficiency:**
- Optimization of tail threading
- Winder slitter quick change and dust removal
- Winder automatic operation

ü **Energy saving:**
- Stock preparation system modification
- All solutions for paper machine energy saving
- OptiDry Coat optimization done already
Zhejiang Shanying PM13 development
Aiming to become the benchmark in the industry

**Quality improvement:**
- Smoothness improvement by
  - Stock preparation optimization
  - Two Valmet Breast Roll Shakers installed
  - Hard calender upgrade
- Coverage improvement:
  - Chemical optimization in curtain coating
- Profiling improvement
  - Automatic coater head profiling

**Achieved:**
- Stickies decreased > 10%
- Formation improved by > 8%, web width increased 30 mm
- Coating grade PPS > 0.2 μm
- Continuing cooperation with coating color suppliers

**Aiming to improve:**
- Coated grade CD coating weight profile > 20%
- Machine efficiency > 2%, decrease maintenance costs by > 5% in short term
- Machine efficiency and preventive maintenance have improved

**Reliability improvement**
- Preventive maintenance
- Info and MES applied
- Condition monitoring
- Field services
- Key asset refurbishment
Zhejiang Shanying PM11 and PM12 development
Aiming to become the benchmark in the industry

<table>
<thead>
<tr>
<th>Target</th>
<th>Project</th>
<th>Performance description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality in basis weight CD profile and formation</td>
<td>PM 11: Valmet Breast Roll Shaker installed</td>
<td>Paper formation improved by &gt; 10%</td>
</tr>
<tr>
<td>Energy saving and machine efficiency improvement</td>
<td>PM 11: Wet end dewatering improvement</td>
<td>Couch roll dryness 21.5%, before top couch roll 10%</td>
</tr>
<tr>
<td>Quality in basis weight CD profile and formation</td>
<td>PM 12: Bottom ply headbox Valmet Dilution Retrofit</td>
<td>The 2-sigma CD variation improved by at least 20%</td>
</tr>
<tr>
<td>Energy saving and machine efficiency improvement</td>
<td>PM 12: Wet end dewatering improvement + vacuum system optimization</td>
<td>1% dewatering increase Better runnability</td>
</tr>
<tr>
<td>Reliability and speed up</td>
<td>PM 12: Dryer section mechanical drive rebuild</td>
<td>Vibration velocity not exceeding 2.8 mm/s Lower maintenance costs</td>
</tr>
</tbody>
</table>
Summary
Summary

ü Shanying International
- is a fast growing company undergoing capacity expansion and intelligent management development,
- aims to become an environmentally friendly and sustainable global company

ü Shanying International and Valmet are strengthening their shared roadmap partnership through
- transparent communication
- innovative cooperation
- win-win development

ü With the latest technologies and digital services, Zhejiang Shanying is aiming for benchmark levels in the machine runnability, efficiency, and quality

ü Shanying International will promote closer relationship with Valmet in all locations