Shandong Huatai Paper – Voith paper machines now meet half of China’s newsprint needs

Shandong Huatai Paper Company Ltd., China’s leading newsprint producer, once again chose a Voith newsprint line: PM 12 was commissioned at the end of October 2006. This article describes its twin machine PM 11, which went on line at the end of 2005.
Voith’s partnership with Huatai Paper started 11 years ago with the delivery of high-tech components for PM 1. This fruitful relationship grew with the delivery of the former Schongau PM 9 in 2000. In July 2003, PM 10 was commissioned, a complete Voith production line for high-grade newsprint.

The outstanding high quality newsprint produced on PM 9 and PM 10 very soon established its reputation on the market. The enormous demand for this paper opened the way for further investments (China’s newsprint needs have almost quadrupled over the last decade). Voith, as preferred supplier, received the order for PM 11 in June 2004, and one year later for its sister machine, PM 12, in June 2005.

Since PM 12 started up in October 2006, Voith paper machines produce no less than 1,200,000 t.p.a. of newsprint in Huatai for the Chinese market – nearly half the national output.

**Shandong Huatai Paper – steep growth**

Everything started in 1976 when Li Jian Hua, now President of Huatai Group, was appointed production manager of a small paper mill in Huatai. That was the beginning of an outstanding success story both for President Li and for his Huatai Group.

Shandong Huatai Paper Company Ltd., listed on the Shanghai Stock Exchange since the year 2000, recorded 750 million Euro sales in 2005. This company belongs to the Huatai Group, active not only in paper production but also in the chemical and printing industries, forestry, logistics and trading. About 4,400 of the Huatai Group’s 10,000 employees work for Huatai Paper, whose mills are located exclusively in Shandong province and currently have a production capacity of 1,200,000 t.p.a. The Huatai management center is located in Dongying, near Dawang.

Huatai Group owns 32.33% shares of Shandong Huatai Paper Co. Ltd. Forty percent of Huatai Group’s assessed value is currently held by President Li Jian Hua. 27.34% by the municipality of Dawang, 20% by 18 members of the company’s executive management and 12.66% by Dawang Group.

_shandong huatai paper PM 11._
Voith Paper provides its customers with the latest technology and first-class service. During the course of time, our close teamwork has blossomed into a genuine friendship between Voith and Huatai. The extremely successful start-up of our Voith PM 11 newsprint machine, with a capacity of 400,000 t.p.a., has not only made Huatai Paper China’s leading newsprint producer, but also consolidated our excellent reputation.

The close partnership between Shandong Huatai Paper Co. Ltd. and Voith, which deepened still further after the successful PM 10 project, made this greenfield mill project a success. So far, PM 11 has developed very well, as confirmed by market reception of the excellent newsprint quality.

This turnkey production line was installed in record time in a building erected directly behind PM 10. Its twin machine, PM 12, has now been installed parallel to PM 11.

The impressively large Huatai mill site includes a power station, pulp production line, canal system to the Yellow River, offices and accommodations, as well as a planned rail connection for transporting paper rolls. Huatai deserves great credit for achieving the rapid growth that has enabled completion of four large paper machine projects in only five years – future-oriented facilities employing the latest technology for first-class paper production in China.

Founded in 2002 with an eye to the future, the nearby Voith Paper Rolls service center is already supporting the Huatai mill. This subsidiary has proved a valuable partner for project execution in such areas as logistics, customs formalities, roll servicing, and small repairs.

In June 2004 Voith was entrusted with delivery of the complete newsprint production line that uses recovered paper furnish. Based on the “One Platform Concept,” PM 11 produces high-grade newsprint in a basis weight range of 42 to 49 g/m² for color offset printing, with an production capacity of 400,000 t.p.a.

This machine has a wire width of 10,200 mm and a design speed of 2,000 m/min. The scope of supply also included the complete deinking line from the drum pulper to the

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**Huatai PM 11 – a complete production line without peer**

Huatai PM 11, one of the most modern newsprint lines in the world and largest in China, was very successfully commissioned at the end of the year 2005 – less than 19 months after contract signing and four months earlier than planned – with the first production series of break-free jumbo rolls. All Voith Paper divisions – Fiber Systems, Paper Machines, Finishing, Automation, Rolls and Fabrics – took part in this project.

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**Customer Comment**

Li Jian Hua  
President and spokesman, Shandong Huatai Group management

“Voith Paper provides its customers with the latest technology and first-class service. During the course of time, our close teamwork has blossomed into a genuine friendship between Voith and Huatai. The extremely successful start-up of our Voith PM 11 newsprint machine, with a capacity of 400,000 t.p.a., has not only made Huatai Paper China’s leading newsprint producer, but also consolidated our excellent reputation.”
finished stock storage tower, including complete engineering, chemical preparation, and automation. Voith Paper Fabrics delivered felts and wires for the forming section, press and dryer section.

Comprehensive control measures based on the Voith quality management system certified to DIN ISO 9001, and compliance with the Huatai internal regulations, ensured trouble-free manufacturing and delivery of all components. For subcontractors and in-house production, all quality control inspections were based on previously defined criteria and certification plans.

To ensure optimal and efficient project execution, several liaison and coordination meetings were held on a jointly established basis. The professional organization and excellent teamwork between Huatai and Voith from start to finish were critical to the success of this project.

Due to the extremely tight paper machine manufacturing and pre-assembly schedule, including all components and civil works, this was another very challenging project for Huatai Paper and Voith. Comprehensive logistics coordination for all suppliers had to be mastered in a very short time. But thanks to the efficiency of Chinese site erection contractors under Voith supervision, the entire erection work was completed in only five months.

All planning documentation to ensure correct erection of the deinking line machinery, piping, electrical installations, control systems and chemicals processing was prepared in close teamwork between the Huatai and Voith engineers. This work was considerably facilitated by the previously intensive cooperation during the PM 10 planning phase, which enabled fast decision-making and detailed optimization based on existing experience.

TopDuoRun, EcoSoft and Sirius.
Key components of the Voith PM 11

- ModuleJet headbox
- DuoFormer T0v with BlackStone S rubber roll covers
- Tandem NipcoFlex press with G2000 polyurethane roll cover
- TopDuoRun dryer section with CeraGuide thermal roll coatings, 8 dryer groups (36 drying cylinders)
- EcoSoft Delta calender with Vantis S calender roll covers
- Sirius reel (parent roll diameter 3,700 mm)
- Tail transfer
- Dryer hood
- Hydraulic and pneumatic systems
- Central oil lubrication system
- Spare parts
- Erection supervision
- Commissioning and operator training

The key components of the tail transfer system after the dryer section comprise a dual high-pressure water jet slitter, a TT3000 “Bullhorn” transfer device, and 11 VTT turbo-transfer belts.

Key components of the Voith DIP stock preparation line for PM 11

- Combi MultiSorter screen (1.2 mm hole diameter) in the first stage, and CombiSorter with cleaner in the second stage
- MC slotted MultiScreen and MiniSorter
- 4-stage heavies cleaner with HydroCyclean and EcoMizer technology
- EcoCell flotation I with 7 primary and 3 secondary cells
- 4-stage fine slotted screening with various MultiScreens and MiniSorters
- Thickening I with Thune bagless disk filter and Thune screw press
- Disperging with equalizing screw and DX disperger, followed by oxidative HC peroxide bleaching
- EcoCell flotation II with 5 primary and 2 secondary cells
- Thickening II with Thune bagless disk filter and Thune screw press, followed by reductive hydro-sulphite bleaching and finished stock storage vat
- Complete additives plant for the DIP line
- For internal water purification 3 Deltapurge microflotation groups were installed by the Voith joint venture partner Meri
- Components for the PM rejects system, plus special control equipment and valves
- Commissioning and operator training

The scope of services agreed upon with the customer includes not only the entire process and control engineering, but also erection contractor support by the Voith erection supervisors.

Key components of the automation systems:

OnControl
- On-machine control

OnQuality
- OnQ ModuleJet, dilution water control with Profilmatic cross-profile control software
- OnQ ModuleSteam, steambox with Profilmatic system
- OnQ ModulePro, dual medium nozzle moisturizer with Profilmatic system
- OnQ ModuleNip, caliper and gloss control with Profilmatic system
- All MD profile controls

OnView
- OnView information system with trending and reporting functions
- RollMaster for optimizing paper roll winding quality on reel

The extensive factory acceptance test (FAT) prior to delivery enabled fast and trouble-free commissioning of PM 11 according to the well-proven “Plug & Work” principle.

High efficiency and product quality, thanks to comprehensive automation

The automation systems are aligned not only to the specific product grade demands on PM 11, but also to individual process requirements ranging from raw material processing to end product handling. They provide a uniform operating and engineering platform for on-machine control.
Key components delivered by Voith Paper Fabrics

- **PrintForm H series**
  Two sets of the Voith Paper Fabrics PrintForm H series were ordered for the forming section of Huatai PM 11. The first set, currently in service on the machine, is performing well in terms of runnability and sheet quality. The PrintForm H series fabrics were designed to control the initial dewatering around the forming roll, pushing more water into the forming shoe and blades for improved sheet formation. PrintForm H forming fabrics have resulted in high dryness at the press section intake, and less wire marking compared with our competitors’ products.

- **Dryer Fabrics**
  Due to our outstanding success with Huatai’s PM 9 and PM 10, Voith Paper Fabrics is the preferred supplier of dryer fabrics for PM 11. The first fabric is currently in service on the first group, and is performing well, with good sheet control and no marking.

The entire stock preparation line planning was based on process technology data derived from the Voith process flow chart and mass flow balance.

All measuring and control equipment was specified, and precise documentation was compiled for programming the stock preparation line process control system. Its implementation was scrutinized down to the last detail by Voith specialists during the course of functionality tests (FAT).

The successful erection and commissioning was based on meticulous planning of all activities in teamwork with Huatai Paper and joint agreement on goals. Thanks to the transparent supervision of project progress, all work was completed systematically and according to plan.

Based on the well-proven Voith project management, site- and commissioning-management system, the erection personnel completed the function tests in teamwork with the commissioning team. Here again, as with all other Voith commissionings, efficient execution was based on transparent and trustworthy teamwork with the customer’s engineers.

“Quality tons on reel and ramping up production as quickly as possible, making a good quality paper” – this common goal was reached in less than 19 months after contract signing – another record in the Huatai success story!

Clearly, the Voith Paper “One Platform Concept” verifiably ensures not only the fastest possible commissioning and steeper start-up curves, but also full compliance with paper quality guarantees for a rapid return on investment.

PM 11 produced paper for the first time on December 31, 2005. After a series of eight breaks-free jumbo rolls of saleable newsprint had been produced, successful start-up was officially certified one week later on January 5, 2006. By the end of January 2006, a continuous output of more than 950 t/day of first-class newsprint had been attained at a production speed exceeding 1,650 m/min. The technical dependability and overall line efficiency, attained so early, already approach the level expected after full optimization.

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**Technical data of PM 11**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design speed</td>
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<tr>
<td>Wire width</td>
<td>10,200 mm</td>
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<tr>
<td>Max. untrimmed web width</td>
<td>9,580 mm</td>
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<tr>
<td>Parent roll diameter</td>
<td>3,700 mm</td>
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<tr>
<td>Production capacity</td>
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<tr>
<td>(at 1,800 m/min operating speed)</td>
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</tr>
<tr>
<td>Raw material</td>
<td>AONP, AOMG, CONP, CMOW</td>
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