This entire project and commissioning impressively shows what can be achieved through an optimal combination of meticulous planning, innovative technology, and competent personnel both on the side of the supplier and the customer. Bernhard Schmidt, Rhein Papier GmbH project manager, sums up the Hürth PM 1 project execution and results as follows: “In the record time of only 12 months from construction start to first paper on the Sirius reel, we completed an exceptional project together with Voith. Hürth PM 1 is certainly one of the greatest successes in our entire company history”.

The customer

Rhein Papier GmbH is a new subsidiary of the Myllykoski Corporation, which was founded more than a century ago. Myllykoski is present in all key paper markets around the world, and specializes in coated and uncoated graphic printing grades. About three million tons of paper are produced annually on 19 machines in the nine Myllykoski mills.

The decision for this modern newsprint line was made in December 2000 in view of the serious shortage of newsprint at that time – a good many publishers and printers had great difficulty during 2000 with paper supplies. Successful negotiations were held with potential paper customers even prior to this decision.

On April 27, 2001 – after hardly 4 months of intensive project work – the contract
was signed with Voith Paper for the delivery of a complete new production line for newsprint, from stock preparation to slitter/winder.

Decisive for the award of this contract was above all Voith Paper’s comprehensive know-how in graphic paper production from 100% recovered paper.

The location near Cologne, Germany, was selected, since most large consumers are in the vicinity of the new production line, which is the only major secondary fiber processing plant of this size in the region.

Project summary

After deciding on the location in May 2001, detailed project planning started immediately, in order to comply with the very tight time schedule:

Construction work started in July, and as of November Voith’s representatives were continuously on site. The erection phase began in December 2001, and to ensure ongoing compliance with the schedule, up to 900 erectors were required at peak times. Production start-up was planned for August 1, 2002, but this goal was reached considerably earlier.

On July 4, 2002 Voith Paper and Rhein Papier celebrated the first paper at the Sirius reel.

Hürth PM 1 plant manager Anne Murtola was very enthusiastic about the smooth start-up of this paper machine:

“We beat the start-up deadline by almost a month – and even at the world record start-up speed of 1,560 m/min. That was the crowning achievement of this outstanding project team!”.

Not long afterwards, Hürth PM 1 already produced paper to market quality standards.

At that time, the production line was in the initial optimization phase – and after only six weeks another record had been broken: the machine was briefly run up to a speed of 1,912 m/min. Never before had this happened so soon after commissioning, and the machine clearly has the potential for continuous production at speeds exceeding 1,900 m/min.

The key reasons for the success of this project can be summarized as follows:

- Innovative technologies
- Single-source delivery
- A forward-looking and quality-oriented maintenance concept
- Excellent time management.

Voith Paper’s “One Platform Concept” systematically developed over the last five years was implemented here for the first time with nearly all its modules. Hürth PM 1 comprises a ModuleJet headbox, DuoFormer TQv, a tandem NipcoFlex press section, TopDuoRun dryer section,
softnip calender and Sirius reel. Apart from the actual paper machine including quality control system, Voith also supplied all the stock preparation machines, as well as all the fabrics from Voith Fabrics.

The unusually short construction time of only 12 months is the fastest worldwide for this kind of production line so far.

A unique maintenance concept has been implemented with Hürth PM 1 for the first time in Europe – Myllykoski closed a service contract with Voith covering the entire maintenance of the mill’s machinery.

Routine on-site maintenance is done by the customer’s personnel, while for all complex service and repair work a qualified VIS team (Voith Industrial Services) is on call. This outsourcing concept originated from Rhein Papier’s need to concentrate on its core competence of paper technology and production.

To shorten commissioning time and ensure optimal start-up, comprehensive on-site training courses were held for the customer’s personnel. Furthermore, Voith provided Rhein Papier with two project managers throughout the realization period. After intensive support during the erection and commissioning phases, our experts are currently on site for consulting and support with optimization.

**Teamwork with the customer**

Both sides were delighted with this smooth teamwork. Thanks to the customer’s efficient and highly qualified team, who tackled this tight schedule very professionally, no delays of any kind occurred.

**Prior target settings**

The ambitious goal set for this project was to build the world’s most modern and cost-effective production line for standard newsprint – without exceeding the budget and without compromising any quality standards. To ensure optimal results, previous project experience and resulting synergies were to be integrated.

The commissioning target was to break the world start-up curve record for this type of production line, and, in the long term, to attain a stable operating speed of 1,800 m/min.

Today, all these goals have already been reached. Only three months after start-up, Hürth PM 1 was producing paper to the very highest quality standards. As confirmed by end customers, excellent printing results were already attained with the first paper deliveries.

As for the targeted speed of 1,800 m/min, this was already exceeded at the beginning of 2003.

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**Technical data**

<table>
<thead>
<tr>
<th>End product</th>
<th>Newsprint made of 100% recovered paper furnish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average production speed</td>
<td>1,800 m/min</td>
</tr>
<tr>
<td>Maximum production speed</td>
<td>2,000 m/min</td>
</tr>
<tr>
<td>Design speed</td>
<td>2,200 m/min</td>
</tr>
<tr>
<td>Wire width</td>
<td>8,900 mm</td>
</tr>
<tr>
<td>Web width</td>
<td>8,150 mm</td>
</tr>
<tr>
<td>Production</td>
<td>280,000 tonnes per year</td>
</tr>
</tbody>
</table>

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**Fig. 1:** Rhein Papier GmbH, Hürth, Germany.  
**Fig. 2:** PM 1 former section.  
**Fig. 3:** Dry end with Sirius reel.
Stock preparation

The Hürth PM 1 stock preparation line (Fig. 4), delivering 880 t/24 h oven-dry finished stock from 100% recovered paper, also reflects the overall project philosophy. Only by combining well-proven components, modules and process stages with system innovations and close teamwork can such a fast and successful commissioning be realized.

Voith supplied all the key stock preparation equipment, from drum pulper charging to thickening, storage, rejects and effluent treatment, as well as broke pulping.

Recovered paper furnish charging

The B+G Fördertechnik charging system for mixed furnish from 40 to 60% ONP and OMG handles loose paper as well as bales. The scope of delivery comprised the entire conveying system including bale dewiring and breaking as well as levelling drum (Fig. 5). Bale feed can be up to 70% of total charge, and in this connection a performance check shortly after commissioning showed a bale dewiring efficiency of more than 98%.

TwinDrum drum pulper system

Immediately after commissioning the TwinDrum (Fig. 6), the enormous potential of this pulping system in terms of throughput and finished stock quality was apparent. Production capacity with maximum drum charge is around 1,700 t/24 h air-dry.

The Voith TwinDrum uses separate rotating pulping and screening drums (with displacement body inside the pulping drum), connected via a transfer station. This enables selective optimization of pulping and screening to suit the respective furnish (for more details, see together 9).

Pulping and screening results with the TwinDrum are far superior to conventional drum pulpers with regard to deflaking, gentle fiber treatment and avoidance of contaminant size reduction. The screen drum rejects are practically free of fibers thanks to intensive washing and screening, thus reducing overall fiber losses in stock preparation.

Cleaning and screening

To prevent deposits and stringing, the drum screen accepts tank is tapered down. At this point the stock is already coarse screened using 8 mm holes.

The stock then passes through six high consistency cleaners with intermittent rejects discharge.

The 3-stage forward-flow MC coarse screening system comprises three MultiSorters in the first two stages followed by a MiniSorter as final stage — all with baskets with contoured 1.0 mm holes. The practically flake-free stock quality demanded by this fine perforation is ensured by the efficient TwinDrum pulper system. Hole screening accepts are pumped to the two storage towers, which operate free of deposits.

Flotation I and II

The Hürth PM 1 flotation system was, up to the time of commissioning, the largest EcoCell line ever delivered by Voith, with a finished stock capacity of 880 t/24 h oven-dry (Fig. 7). It includes a pre-flota-
tion stage with six primary and six secondary cells delivering the accepts forward, and a post-flotation stage with five primary and three secondary cells.

**Fine screening**
Pre-flotation is followed by an effective 4-stage LC slotted fine screening stage with 0.15 mm C-bar technology. Stages 3 and 4 are both in tandem layout and enable efficient stickies removal. This has an extremely favourable effect on paper machine runnability.

**Disperging**
For efficient dirt speck reduction, stickies disintegration and deinking, the next stage is disperging (Fig. 8) with two EcoDirect dispergers.

Steam is injected directly into the housing of this new disperger type, so that no prior heating screw is required. The high stock consistency required for disperging (up to 30%) is ensured by the preceding thickening stage I with disc filter and two screw presses.

Disperging is followed by post-flotation, thickening stage II, and finally by storage of the finished stock.

**Effluent and rejects handling**
The Voith Paper joint-venture partner meri supplied all the rejects handling equipment including channel rake, magnetic separator, shredder and compactor.

Rejects from the cleaners are handled by a Sedimator, while the coarse screening rejects are handled via Elephant filter and compactor for disposal. Meri also supplied the entire effluent treatment plant, comprising three Deltapurge machines.

Sludge is dewatered by two gravity tables, plus Elephant filter and sludge presses. Effluent is pre-cleaned by Elephant filter and microfloculation before passing to the effluent plant.

**Other equipment**
Voith also supplied all the broke pulpers for the paper machine and the two slitter-winders (Fig. 9).

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**What does this project say about Voith?**
This project has once again demonstrated Voith’s innovation competence, not only in developing new concepts, but also in carrying them out efficiently.

Voith concentrated, as always, on customer needs and developed solutions optimally meeting them through:

- complete system delivery
- uniform standards
- clear interfaces with other suppliers
- taking over machine servicing and maintenance, thus enabling the customer to focus on his core activities of production and end product marketing.

**World records broken by Hürth PM 1**
- Production start-up only 12 months after beginning site work
- Start-up speed of 1,560 m/min
- Production speed of 1,912 m/min only six weeks after commissioning.