At the end of January 1999 Voith Paper was awarded a contract by Haindl Papier GmbH & Co. KG for replacing a newsprint machine, in operation since 1962 at the Schongau mill, with a new machine for producing high grade SCB from 100 % recycled paper.

Haindl is one of the largest European producers of wood containing roll-printing paper.

On three Voith paper machines, the Schongau mill produces about 650,000 tonnes of printing press paper per year.

Apart from standard newsprint, the wide product range in Schongau increasingly includes improved rotogravure or offset printing grades. Standard newsprint mainly comprises 80 % DIP and 20 % TMP. For the improved grades, exclusively DIP is used.

Targets with the new PM 9 installation were as follows:
- Replacement of a 38 year old paper machine
- High grade SCB production from 100 % DIP
- Greater output
- Long-term workload security.

To ensure overall project cost-effectiveness, the old paper machine had to be replaced as quickly as possible. Furthermore, the old machine had to be dismantled very carefully for sale to a customer in China. As of May 2001, this machine should be producing standard newsprint from recycled paper again at Dongying Huatai Paper.

The extremely short down time was only possible thanks to the extensive preparations made prior to the shutdown of the old machine as well as during the outage:
- Assembly and commissioning of the main hydraulic aggregates
- Structural modifications to the machine building

Schongau PM 9 –
Installation of the latest technology for new SCB-Plus quality from 100 % DIP in 56 days
... an investment for the future
Pre-assembly of all machine components in the suppliers’ works
Tail transfer system design and construction to enable transfer tests from the last drying cylinder to the Sirius winder five days prior to production startup
Intensive operator training
Compilation of a detailed commissioning schedule with computer-supported deadline monitoring
Formation of eight working groups in teamwork with the customer for interchanging experience on comparable installations, avoiding repetition of errors, taking into account the operator’s system know-how, and successively improving the system

Formation of a steering committee for making all main decisions and ensuring compliance with important deadlines.

**PM 9 machine layout (Fig. 2)**

With a working width of 6,100 mm, PM 9 is not a particularly large machine, but its design concept and operating speed of 2,200 m/min make it one of the most modern paper machines worldwide.

This new “One Platform Paper Machine Concept” comprises the following components:

- ModuleJet headbox adapted to the new Profilmatic MQ system, which almost instantaneously adjusts the basis weight by intervening directly in the ModuleJet mixing units thanks to a newly developed stock consistency measuring sensor,
- DuoFormer TQv, a state-of-the-art vertical former concept for graphical grades,
- Closed draw Tandem-NipcoFlex press section for highest dry content, symmetrical drainage and secure web control,
- TopDuoRun without exterior fabric guide rolls, with open draw after the first drying roll,
- New moisture cross-profile control concept – without rewetting – for SC paper production,
- Janus calender MK 2 inclined at 45 degrees with 10 rolls, divided into two separate stacks,
- Sirius winding system with reel oscillator.

The DuoFormer TQv vertical former specially developed for PM 9 is not only attractive, but also has a large forming potential, great flexibility, and easy accessibility for cleaning and changing wires and rolls (Fig. 3).

Based on operating experience with existing Tandem-NipcoFlex presses, the first closed draw press section was installed on PM 9 in Schongau.

Closed draw in this case means that between individual presses, and between the press and dry section, only slight constant velocity differentials are required with no free web draw.
This goal was reached by modifying the transfer sections after the presses and providing for a free web draw after the first drying cylinder. A velocity differential here of 1.6 to 2.1% generates the web pre-tensioning required for ensuring troublefree transfer to the first dryer group (Fig. 4).

To meet the high demands for rotogravure and offset-heatset printability of 100% deinking paper with PCC fillers, a Janus calender MK 2 inclined at 45 degrees was installed. This comprises 10 rolls in two identical stacks, with individual line force control (Fig. 5).

The Janus MK 2 is designed for a line force range of 30 to 500 kN/m and a maximum FLEXITHERM roll surface temperature of 160°C.

Four steam humidifiers provide the additional moisture content and heating required for improved calendering results.

**Design is not only a question of taste, but also of style.**

While the exterior design of the new PM 9 is truly stylish, its interior embodies the very latest technology (Figs. 1 and 6).

**56 days from paper to paper – a world record indeed**

Decommissioning and dismantling an entire paper machine ready for assembly at a new location, replacing it with a new high-tech paper machine, carrying out extensive structural modifications, completely reshaping the periphery in part – and recommissioning everything exactly on time – demands overall project planning right down to the last detail together with a well-versed team.

Long before the old PM 9 was finally shut down, structural and assembly work was in progress all over the place.

- Structural work commenced already in June 1999 by building control rooms, offices and social facilities alongside PM 9. The building length was extended with an additional bay, at the same time creating an erection opening for removing the old components and installing the new ones. New concrete foundations were installed for the former and the Sirius winder.
- Between July and October 1999, completely new switch gear rooms were built and part of the equipment installed.
- A new hydraulics room was constructed.
- Already in September 1999 a start was made on connecting and commissioning the approach flow section and heat recovery. This work included in particular replacing the deculator and vertical screens, installing a new heat recovery system, and installing new pulpers.
- The former exhaust aggregates were installed and precommissioned.
- Large auxiliaries such as the lubricating systems, Nipco hydraulics, combi-hydraulics and thermo-oil system were assembled including piping, then
Design data of the new PM 9
Paper grade SOG A top T (SCB-Plus)
Design operating speed $v_K = 2,200$ m/min
Operating speed (phase 1) $v_B = 1,500$ m/min
Basis weight $45-60$ g/m²
Ash content in paper $30-34\%$
Working width on pope roller $6,100$ mm
Furnish $100\%$ DIP
Fillers Kaolin + PCC

The enormous strategic importance of this project for Haindl Papier and Voith Paper, the extremely short project completion deadline and rebuild time – despite difficult conditions – demanded a quantum leap in cooperation between the paper machine supplier and the customer. Even the first four months of continuous operation demonstrated the great potential of PM 9 for quality and productivity.

Figs. 1 and 6: PM 9 in new design.
Fig. 7: PM 9 with Janus MK 2 and Sirius.

First production results

Dipl. Ing. Artur Stöckler, plant manager at Haindl Papier GmbH & Co. KG Schongau, assesses the project execution, commissioning and initial operating results extremely positively:

After exactly 56 days of rebuild time, the new PM 9 went into service right on time at an operating speed of $1,330$ m/min. From the first day on, it has been producing SCB paper in non-stop operation. Haindl’s high demands on operating speed, overall efficiency and production output were significantly exceeded after only two months. Thanks to the excellent cross-profile for humidity, basis weight and sheet thickness, online production requirements for SCB paper are ideally met. The low mill waste quota, and above all the positive feedback from numerous rotogravure printers, confirm that this was the right concept to choose.

flashed and commissioned together with the control system.

The Sirius winder was installed without reel magazine.

Thanks to complete preassembly of all machine sections including piping and wiring, limit switches, etc. in the Voith Paper works, the paper machine erection work in Schongau went ahead rapidly. In some cases the main functions and motion sequences were already tested in the Voith Paper works.