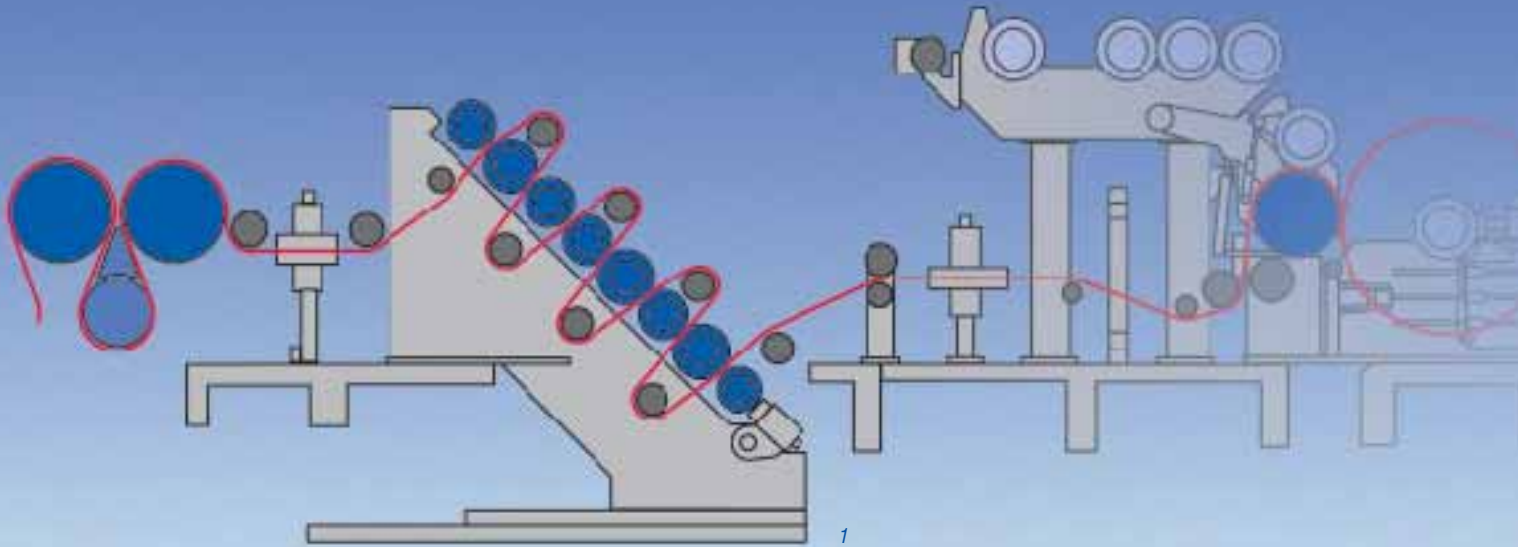


A concept confirmed



The author:
Hans Witschel,
Finishing

A good many articles – quite controversial in some cases – have already been published on the new Janus calender generation, i.e. the MK 2. Successful startup of the new PM 5 with its MK 2 Janus calender at Gebrüder Lang, Ettringen (Fig. 1) now confirms this concept in full.

The target set for this new machine was ambitious: online production of calendered rotogravure printing paper matching all the surface characteristics of an offline supercalendered paper.

When the Janus concept was first introduced, offline calendering speeds had jumped from 600 to 1,000 m/min. The Janus MK 2 in Ettringen brings another quantum leap from 1,000 to 1,500 m/min – but this time online. After Lang had decided not only for the Janus concept again, but also to install the first MK 2 calender, a good many risk assessment

meetings were held to ensure successful project implementation.

This project greatly benefited from the open cooperation between all concerned – which was indispensable to ensure success in the face of pessimistic attitudes which had been spread on the market.

Detailing all the differences between a conventional vertical calender and the MK 2 design would exceed the scope of this article. Even checking the new roll

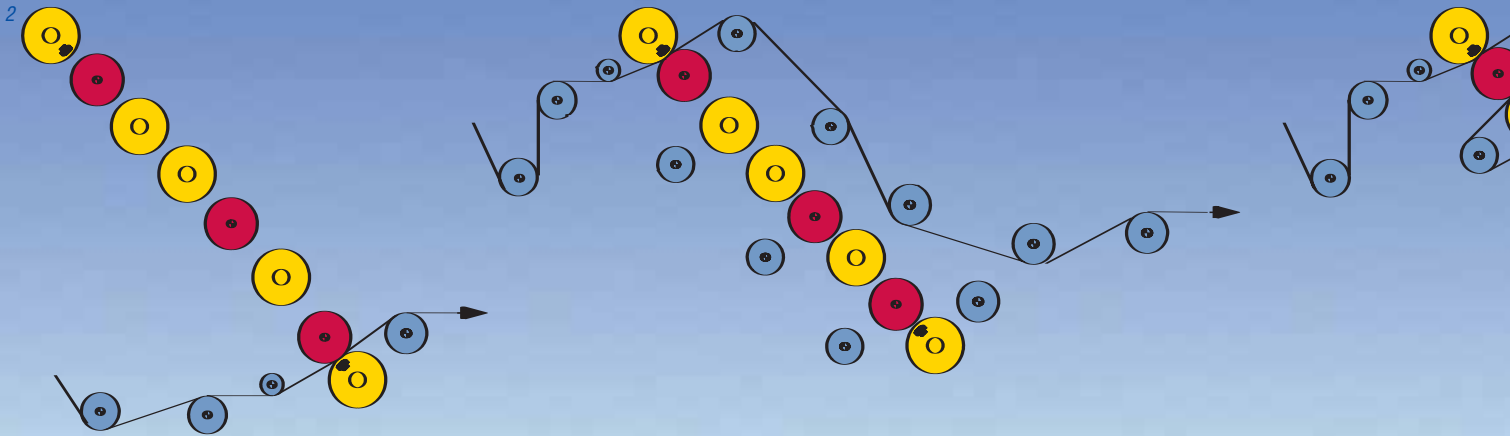
Technical data

- Furnish components:
 - 55 g/m² SC paper
 - DIP approx. 83 %
 - Groundwood approx. 12 %
 - Softwood pulp approx. 5 %
- Gloss ↕ 45% Hunter 75°
- Roughness ✚ 1.2 ◯m PPS-S10
- Porosity < 20 ml/min Bendtsen
- V_{max} for newsprint 1,800 m/min
- V_{max} for SC-A grades 1,500 m/min

Fig. 1: The Janus MK 2 calender.

Fig. 2: Web threading on the Janus MK 2.

Fig. 3: Janus MK 2 at Lang Papier, Ettringen, Germany.



changing concept required not only 3-D computer simulation, but also a physical 1:10 scale model of the complete calender.

At the end of August 1999 the first milestone was reached: the calender was closed without any problem. This had been preceded by initial optimization of the paper machine, including test-threading through the calender from the end of the dry section to the Sirius reel (Fig. 2).

The MK 2 was then started up in one of the three possible operating modes: newsprint calendering in the lowest nip only. The second alternative is newsprint calendering in the upper nip – and the third alternative is of course the actual design mode, using all three calender rolls for rotogravure paper.

Although no speed records were broken to start with, the first reel of paper was

nevertheless calendered at 1,250 m/min.

In addition to the new MK 2 calender, the numerous innovations on the paper machine included a completely new control and visualization concept. Commissioning was therefore a special challenge both on the side of the customer and the supplier.

After a successful startup, the general sense of relief around midnight was certainly worth a celebration!

This was followed by a phase of very intensive optimization, during the course of which all functions of the Janus MK 2 were coordinated to perfection with the paper machine and Sirius functions.

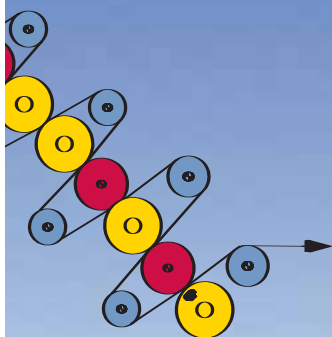
Toward the end of this phase in the second half of September, rotogravure paper was calendered for the first time using all nips.

This had not really been planned as yet, but in view of the completely stable transfer from Janus to Sirius at a speed of 1,350 m/min, it was spontaneously decided to open up the entire width and use all calender nips.

The other operating mode – newsprint calendering in the upper nip alone – was then tested straight away the next day.

As shown by the technical data, the design operating speed for fully calendered SC grades is 1,500 m/min. The design speed for newsprint increases to 1,800 m/min, and at the time of writing (November 1999) test runs had already been carried out at 1,465 m/min with newsprint.

Here are some of the calendering areas where the innovations involved in this concept demanded special attention:



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- Post-humidification
- Web threading
- Frame layout
- Roll deflection
- Vibration freedom
- etc.

The conventional way of humidifying SC-A grades – rapid drying followed by water spraying to the required web humidity – was not possible in this case due to the risk of transparent calendering in case of water drops. Instead, measures were taken to ensure the flattest possible humidity cross-profile – at a high level – already at the paper machine/dry section.

Fine correction of the humidity level is carried out afterwards by precisely controlled spray nozzles installed before the last drying aggregate, due to the neces-

sary dwell time for conditioning. This concept proved very successful.

Web transfer through the calender for winding is based on the concept already well-proven on PM 4 in Ettringen. The leading edge is transferred from the last drying roll by Fibron vacuum belts to the calender rope system. After leaving the calender, a so-called pullstack generates the web tension indispensable for stability of the leading edge, which is then transferred by vacuum belts to the Sirius reel. Despite the experience gained on PM 4, it goes without saying that the right settings had to be established empirically for each of the various paper grades. Those grades with high moisture content and high fillers content demanded the greatest efforts for establishing the right settings.

As expected with the 45° orientation of the MK 2, most of the questions arising before startup concerned the calender stand and stack layout. Throughout the entire project design phase, attention was repeatedly paid to matters such as vibration and noise damping as well as resultant cross-profile effects.

But all these suspicions were dispelled on the first startup. Simply a “laying on of hands” is enough to establish the almost complete freedom from vibration of the calender.

Although PM 5 has not yet entered into routine operation, we and our customer already have every reason to celebrate:

Choosing a Janus MK 2 was the right decision.