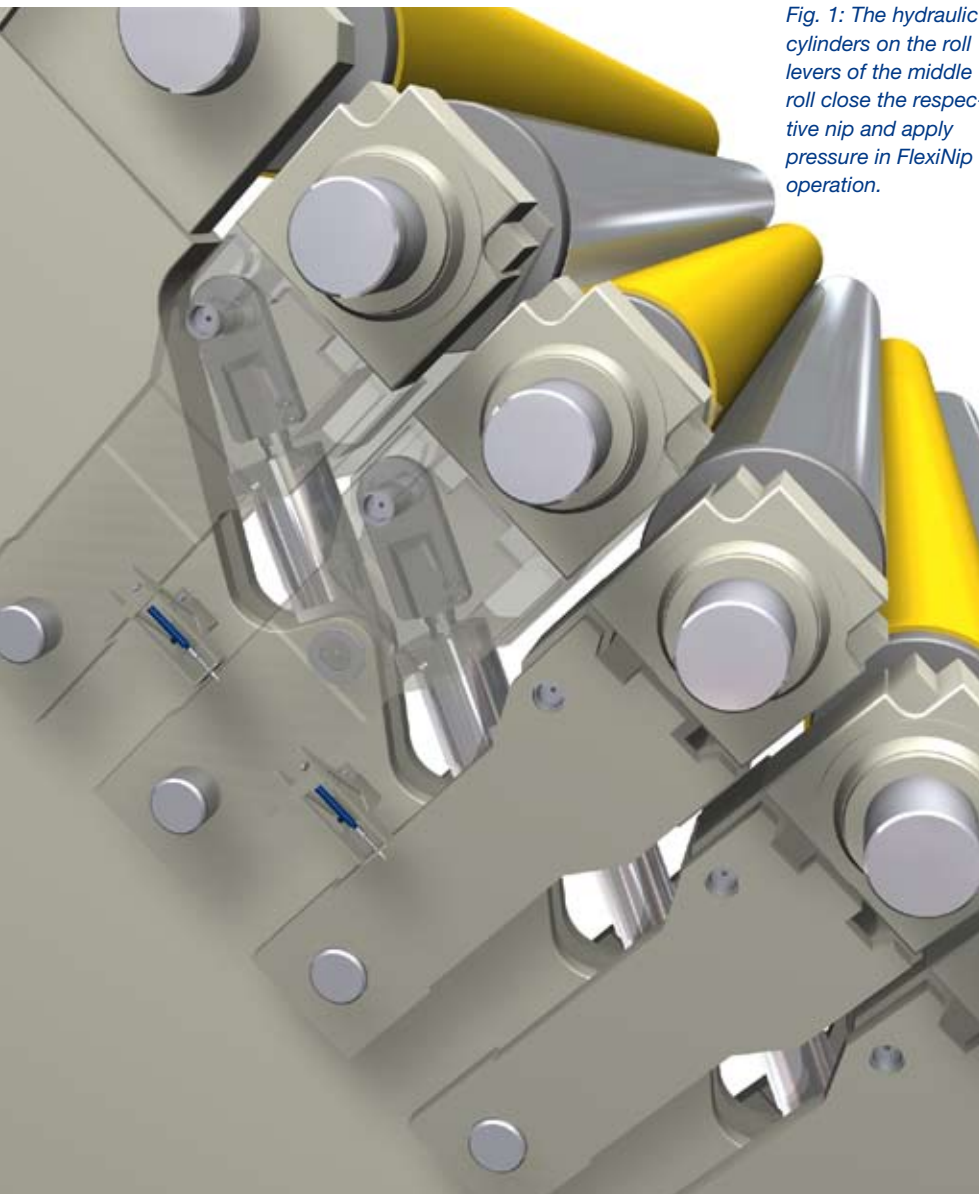


Produce different paper grades on one calender

FlexiNip concept in the Janus MK2 calender increases flexibility

The demands placed on multi-roll calenders are becoming ever more complex. Apart from augmenting speed and working widths, there are increasing demands for the capability to produce different paper grades on one calender. To meet these demands Voith Paper has developed the FlexiNip concept.

Fig. 1: The hydraulic cylinders on the roll levers of the middle roll close the respective nip and apply pressure in FlexiNip operation.



In the case of wood-free coated papers, for example, the new concept enables matte and satin finishes to be produced in addition to high-gloss grades. In the case of uncoated papers, newsprint or improved newsprint can be produced in addition to SC qualities (SC-A, SC-B). This is in line with market requirements.

The correct production mix is crucial

Single-nip operation in a Janus calender is already well established as a fixed concept. The first Janus MK2 calender of this kind was supplied to Myllykoski in Ettringen, Germany for its PM 5 in 1999. It offers the option to produce standard newsprint, in addition to SC grades, in either the very top or very bottom calender nip.

Double-sided calendering is achieved by simultaneously closing the top and bottom nip. The roll nips not used stay open. In the case of paper machines with online calenders, the web run is not changed in this process, i.e. the web runs through both the closed and open nips of the roll stack. In offline calenders, on the other hand, the open nips are bypassed (Fig. 2).

Using the example of wood-free coated papers, Figure 3 shows the quality range that can be achieved with a 10-roll Janus MK2 compared with single nip operation in the top and bottom nip. It is clear that papers with gloss values between 35-55 gloss points cannot be produced. Paper grades calendered with 10 rolls are too glossy. Those paper grades

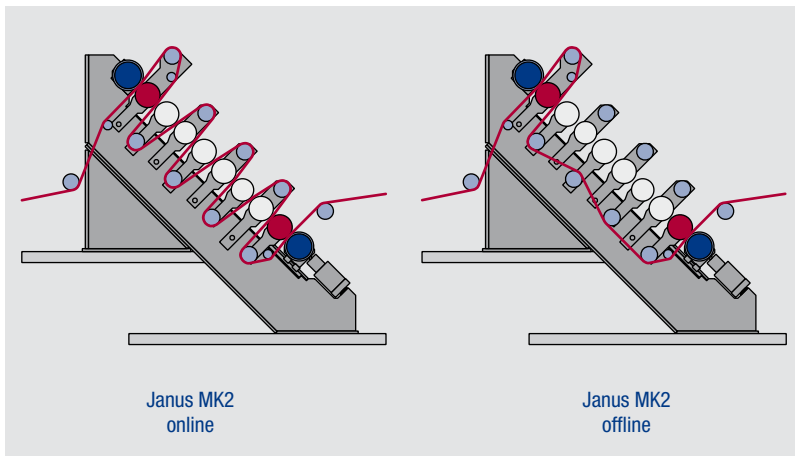


Fig. 2: Unlike online installations, the open nips are bypassed in offline calendars.

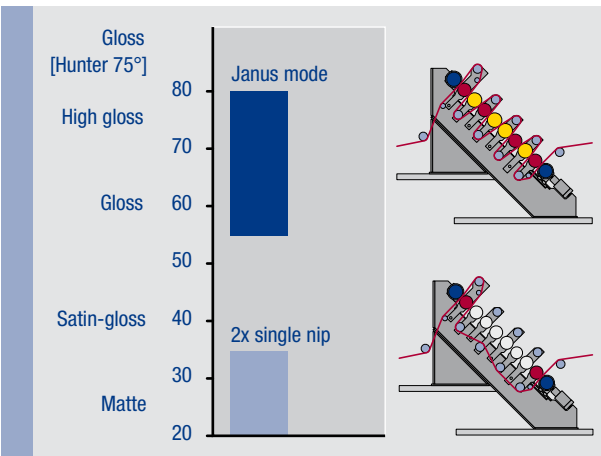


Fig. 3: Matte qualities are also achievable using the 2x single nip mode.

that run through only two very lightly loaded single nips naturally remain very matte.

Maximize potential

Voith Paper has systematically extended the concept for using single nips in the roll stack. The latest generation of Janus MK2 calendars opens up the possibility of closing either single nip, 2x single nip,

2x double nip or 2x3 nips – this is the FlexiNip concept (Fig. 4).

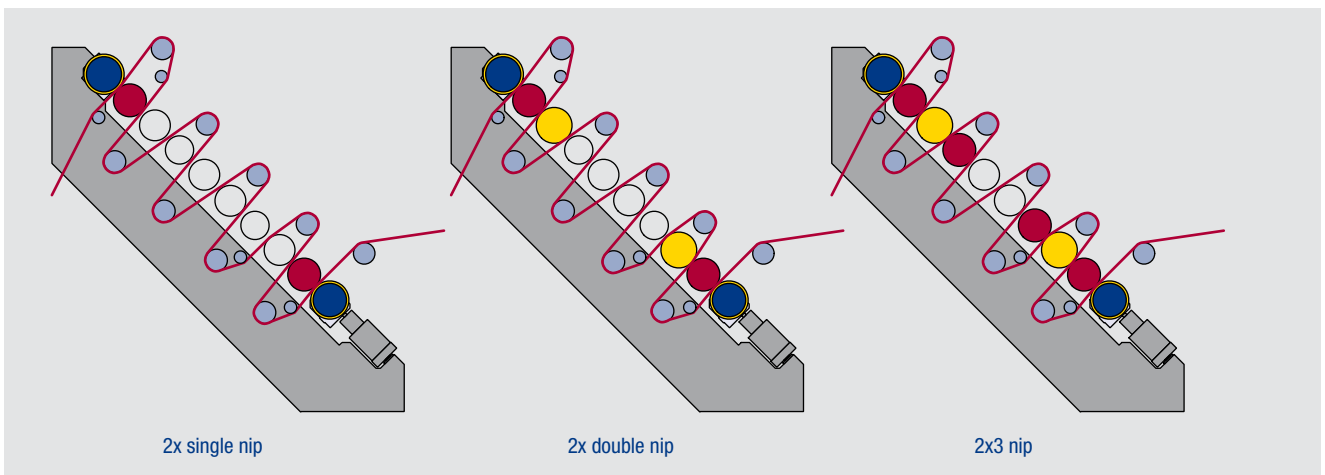
The number of nips for influencing the top and bottom side of the paper can be combined as required. For example, in the case of a strong, double-sided paper in extreme circumstances the top side of the web could be calendered with three nips closed and the bottom side with only one nip closed, and vice-

versa. This clearly demonstrates that this concept is truly worthy of its “FlexiNip” name.

Simple functioning principle

Figure 1 shows how individual nips in the roll stack can be used separately. Hydraulic cylinders are installed on all roll levers to compensate the weights of the respective rolls in Janus operation.

Fig. 4: The number of nips used can be selected according to paper quality.



Customer	Number of rolls	Date of delivery	Operation mode single nip
Mylykoski – Ettringen PM 5	8	1999	single nip top single nip bottom
Mylykoski – Alsip PM 1	8	2001	single nip bottom
Leipa Schwedt PM 4	10	2004	single nip bottom
APP – Dagang PM 3 (two Offline-Janus MK2)	10	2005	2x single nip
Daio Mishima PM 10	10	2007	2x single nip
Stora Enso Huatai PM 6	8	2007	2x single nip
Bhigwan PM 2	10	2008	2x single nip
APP Hainan PM 2 (two Offline-Janus MK2)	10	2009	2x single nip

Fig. 5: The single nip mode has already been realized in the installations listed above.

Customer	Numbers of rolls	Date of delivery	Operation mode single nip
N.N. North America	7	2007	1x single nip 1x double nip
Oji Nantong PM 1 (two Offline-Janus MK2)	10	2009	2x single nip 2x double nip
Shouguang Mei Lun Paper PM 6 (two Offline-Janus MK2)	10	2010	2x single nip 2x double nip 2x3 nip
Donghae PM 1 (two Offline-Janus MK2)	10	2010	2x single nip 2x double nip

Fig. 6: Four customers have already ordered a Janus MK2 calender with FlexiNip.

In FlexiNip operation these lever cylinders also perform the function of closing the respective nip and applying pressure. Optionally, one, two or three nips can be closed in the upper and lower roll positions. Position sensors on the levers control the movements of the rolls. As a component of the NipProtect system, a quick-release function prevents damage to rolls, e.g. after a web break.

A production change can be done simply and quickly, as every FlexiNip variant needed can be selected via a preset control program.

Reap the benefits

The Janus MK2 with FlexiNip concept covers the entire range of different paper grades in a calender and is therefore also ideally suited to meeting changing market conditions and product requirements. The desired paper quality can be achieved in every paper segment by choosing

the correct number of nips. The diagram in Figure 7 shows at a glance the operating modes that are now possible thanks to FlexiNip. Where blocks overlap the operator can choose whether to work with the lower instead of the higher number of nips. In addition, energy costs can be reduced with this targeted use of the required number of nips. This

extra flexibility – “quality-driven” versus “cost-driven” operation – is an additional benefit offered by the FlexiNip concept.

This means that the FlexiNip concept in the Janus MK2 calender represents maximum flexibility with quality-driven and cost-driven use of the required roll nips.

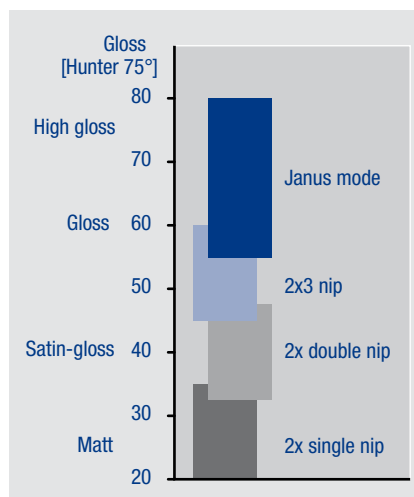


Fig. 7: Quality ranges made possible by FlexiNip.

On Focus: FlexiNip concept

ProRunnability

ProQuality

ProEnvironment

Section: calender
Width: all
Paper grade: SC, LWC and WFC

Contact

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