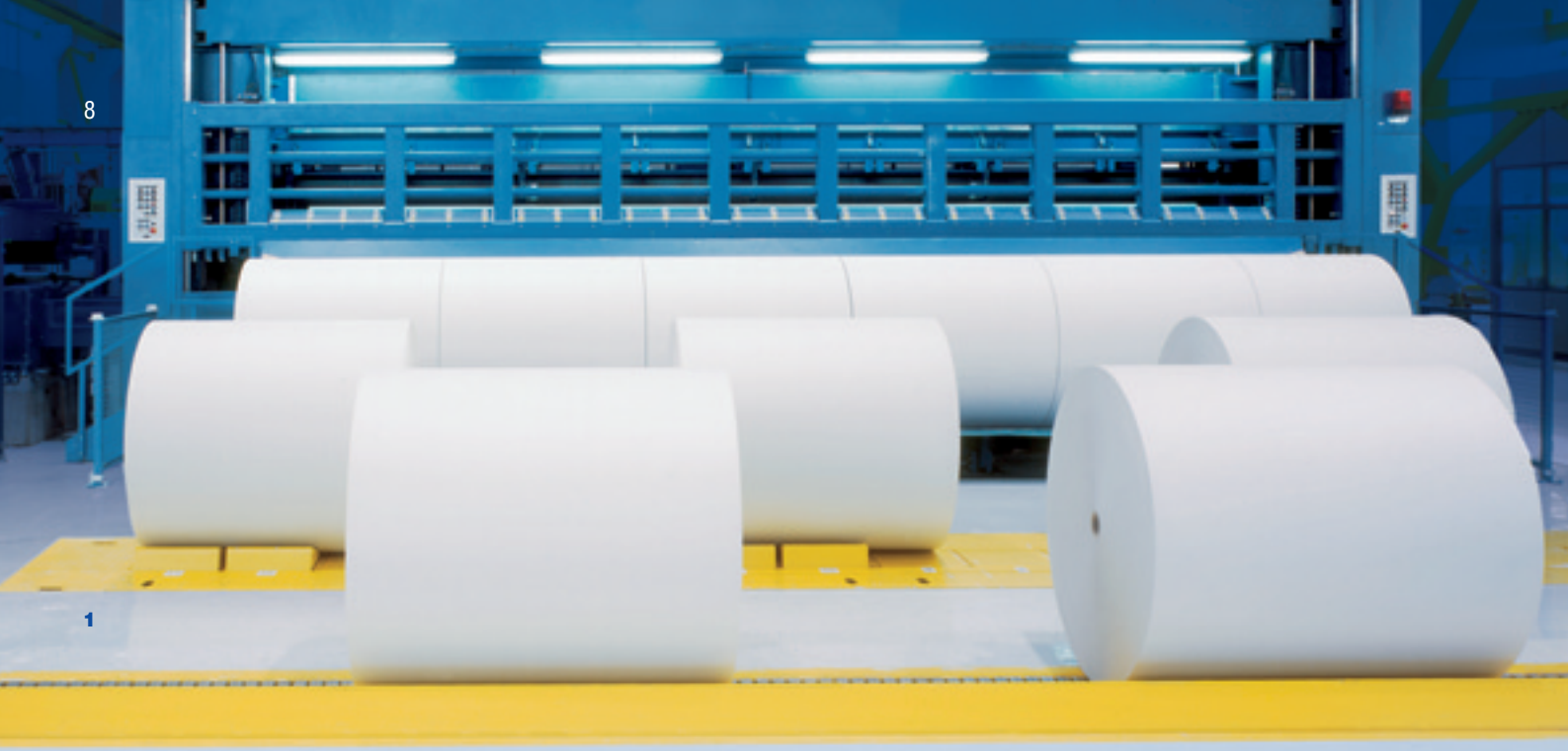

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VariFlex™ two-drum slitter-winders – for perfect newsprint rolls at Rhein Papier, Hürth, Germany

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In the year 2000, Myllykoski – a global player and specialist in coated and uncoated graphic grades – decided on a completely new central European newsprint production plant. After tender negotiations, the paper machine (PM 1) for this plant was ordered from Voith Paper in March 2001. One month later an order was placed for two VariFlex L™ 2-drum slitter-winders (working width 8,200 mm) and a VariFlex S™ rewinder (working width 2,800 mm).

The two slitter-winders are designed to easily handle the entire output of PM 1, i.e. 280,000 t.p.a. of newsprint with basis weights from 36 to 48 g/m^2. At operating speeds up to 2,500 m/min, finished paper rolls wound to a diameter of 1,350 mm are produced.

The results impressively proved again here, that VariFlex™ 2-drum slitter-winders are the ideal solution for newsprint production. This article explains the reasons.

Newsprint wound on conventional 2-drum slitter-winder with hard steel surfaces is very susceptible to folding. These hidden faults, which usually remain undetected in the paper mill, are bound to cause breaks in the printing press. As a result, the entire newsprint roll is wasted. The cause of folding is high radial nip loads between the steel drums and the paper roll.

To avoid such high loads, paper roll

weights had to be significantly restricted so far. The production output of conventional 2-drum slitter-winders, i.e. winders equipped with steel drums, was therefore limited. With the VariFlex™ concept, this limitation is now a thing of the past because the first drum is covered with Multidrive™ elastomer. Winding dynamics on this special cover are quite different from those on hard steel drums. The following aspects are involved:

On the one hand, newsprint demands the greatest possible winding hardness in the ingoing nip in order to minimize folding problems due to layer displacement (J line). On the other hand, layer displacement is caused by radial forces in the ingoing nip, which must, therefore, be minimized.

On machines with conventional steel drums, winding hardness is increased by the fact that the steel drums are deeply pressed into the rolls – but this also increases the undesirable radial nip forces. With unequal cross-profiles, the result is excessive overloading in some zones across the roll width, which is bound to cause winding defects.

Attempts have been made to combat the limitation of winding diameter by using the largest possible drums and increasing the web tension – which however increases break frequency – but without much success.

With the VariFlex™ concept, the MultiDrive™ elastomer cover is compressed by the weight of the roll. The reduction in thickness of the cover leads to a dynamic deformation process within the cover. I.e. the cover is accelerated in the nip area and its higher velocity is transferred to the roll. Since the resulting speed is higher than the web intake speed, the differential velocity exerts a stretching force on the web which increases the winding hardness.

With the MultiDrive™ technology it is even possible to produce higher hardnesses – while simultaneously reducing the web draw – than obtainable with steel drums of large diameters in combination with high web draws.

Furthermore, flattening of the cover under compression also reduces the radial nip forces on the paper roll, thus eliminating layer displacement. As an additional advantage, the cover flexibility enables optimal adaptation to the roll profile.

Thanks to all these benefits, Voith Paper's new slitter-winder generation is already known as "the soft revolution". This summarizes very aptly one of the main reasons why this concept has attained such success so rapidly. More than 150 new machines and rebuilds (also of other makes) have so far been fitted with Voith elastomer roll covers and operating results are excellent in all cases.

Fig. 1: *VariFlex™ two-drum slitter-winder at Rhein Papier, Hürth, Germany.*

Of course, the VariFlex™ concept is highly automated. Apart from automatically splicing the old and new web ends during winding, this also includes automated set-change with roll start and finish gluing. As a result, production is practically continuous and uninterrupted.

Newsprint production today, generally from 100% recovered paper and at high processing speeds, demands state-of-the-art slitter-winders for optimal results. VariFlex™ two-drum slitter-winders ensure perfect winding quality at roll diameters up to 1,350 mm, thus proving that this is truly a future-oriented concept.

And true to the Voith philosophy, the customer shall have the last word:

"We at Rhein Papier", said project leader **Bernhard Schmidt**, *"are really proud of our new production line. PM 1 broke all records for start-up speeds so far, and our paper rolls were on the market considerably earlier than originally planned. The winding quality we now achieve certainly confirms that we made the right choice with VariFlex™ slitter-winders. Currently the Voith team is working hand in hand with us on fine-tuning for even better results, and with such excellent cooperation, we are making great progress. My complements and thanks to all concerned!"*