

Pure high technology – NipcoFlex shoe press.

NipcoFlex shoe presses and QualiFlex press sleeves for optimal dewatering

Evolution instead of revolution

The technology of the closed shoe press has been on the market for over 20 years. Nonetheless, milestones in the efficiency of paper machines are still being achieved with NipcoFlex shoe presses and QualiFlex press sleeves through consistent development.

The technology of the closed shoe press was already launched in a first application in 1984. The advantages that can be obtained with shoe presses are not only the energy-efficient optimization of a production line. The rise in dry content here leads to a reduction of thermal drying energy, with the additional consumption of electrical drive energy being overcompensated by far. Additional advantages include, e.g., longer felt running times or improved runnability of the production line due to fewer breaks. With gradual introduction of shoe press technology, starting with packaging paper and going through all other paper grades all the way to the shoe calender, over 400 shoe presses

have been successfully brought onto the market so far.

Undisputed market leadership

The 400th NipcoFlex shoe press was sold by Voith Paper to Tamil Nadu Newsprint and Paper in India. It is part of the new PM 3, which will produce high quality, wood-free writing and printing paper. The PM 3 has a wire width of 6,100 mm and a maximum speed of 1,200 m/min. It will be equipped with a Tandem NipcoFlex press section, in which the enormous dewatering capacity of two NipcoFlex shoe presses is combined with the volume-conserving pressing, completely without the

classic roll nip. The NipcoP counter rolls to the shoe roll are equipped with the new grooved stainless steel cover, G-Flex. In addition, QualiFlex press sleeves are also supplied for the NipcoFlex shoe presses. Voith Paper is the only manufacturer that has shoe press and press sleeve technologies concentrated under one roof; thus, they can be optimally coordinated with one another.

For Tamil Nadu, this is already the fourth shoe press after rebuilds of the PM 1 and PM 2 in 2002. This follow-up order shows the confidence Tamil Nadu has in this proven technology. With a market share of 60%, Voith is the clear market leader in this segment.

Mini NipcoFlex shoe press

Depending on the production line size and required output of the shoe press, the construction kit of available module sizes had already been consistently expanded in the past and oriented to market needs. Specifically in rebuild situations with restrictions regarding space requirements or crane capacity, Voith was always in a position to offer the most compact shoe press rolls with the highest power density.

This construction kit is now supplemented by the Mini NipcoFlex press. Here, it's a matter of a new shoe roll size with only 770 mm diameter. Despite this very small diameter, an

enormously high power density was achieved, so that with a sheet width of 4,500 mm a line load of up to 500 kN/m can be attained.

It is significant that all essential components of the NipcoFlex technology, already proven in many instances, such as pressure shoe, press system or hydraulic concept, were also taken over for this new roll size in order to offer maximum reliability.

As an example, the integration of a Mini NipcoFlex press into a multiple-roll press, as was done with the first order for a customer in Italy (Fig. 1), can be cited. The Mini NipcoFlex press is generally an ideal rebuild

solution for small and medium-size machines. As an application example, a press rebuild of a paper machine for production of wood-free paper grades that is 5,000 mm wide (Fig. 2) can be noted. Starting with a roll press with a 120 kN/m line load in the third nip, with which 45% dry content is achieved, the dry content can be increased by 3% to 48% by using a Mini NipcoFlex with a 450 kN/m line load.

In Fig. 3 the energy-related and financial effects for 80 g/m² paper at 1,200 m/min are shown. The higher dryness corresponds to a saving of 115 t of steam per day or approx. 72,200 kWh/d less energy. But at the same time only ca. 4,900 kWh/d

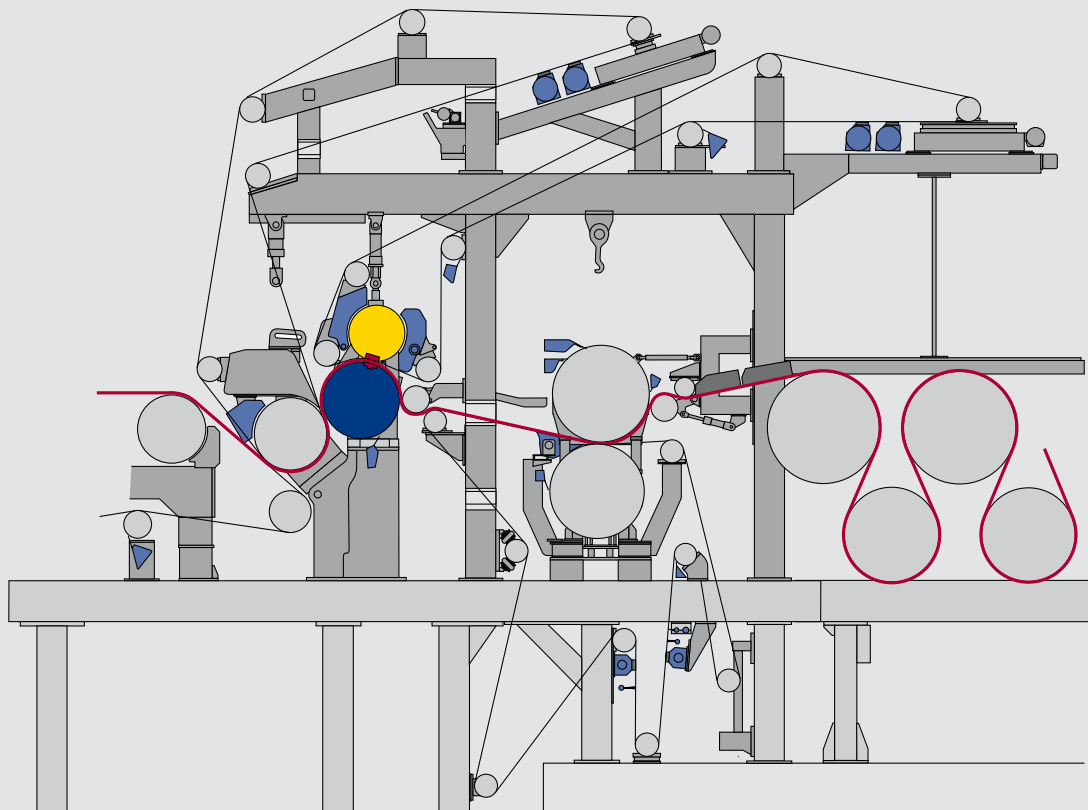


Fig. 1: First Mini NipcoFlex installation (blue and yellow) in Italy.

more electrical energy are required for the drives and hydraulic system. It thus becomes very clear that a shoe press is the ideal way to save large amounts of energy. Even taking into account the fact that a kWh of steam is more cost-effective than electric current, good values result for the ROI. Despite extra expenditure for drive energy or press sleeves the paper manufacturing costs in the selected example can be reduced by almost 900,000 euro per year to a large extent as a result of energy savings. And this does not yet take any account of possible additional production due to increased speed.

QualiFlex press sleeves

The performance of a shoe press is also significantly dependent on the performance of the press sleeve used. The essential factors for success here are the right surface selection, with grooved sleeves maximum stability of the land area and an especially wear-resistant

material. Only if all three criteria are met a press sleeve can contribute to lastingly ensure the maximum performance of a production line over the entire life time.

In the development of QualiFlex sleeves, work is continuously done on all three areas. With the introduction of an interrupted groove in the surface portfolio, customer needs can now be addressed in a more individual fashion. Precisely for systems in the transitional range between blind-drilled and grooved sleeves, this can be a way to optimize the dry content without getting problems with water spraying back. With over 100 different possibilities, QualiFlex sleeves thus offer the largest surface variety on the market and allow individual coordination with the requirements.

With optimized polyurethane grades, there has been success in combining the highest abrasion resistance with extremely high stability of the grooved

sleeves' land area under load and the required flexibility for use in shoe presses. The result is a void volume in the nip that is up to 20% higher. This is the basic precondition for efficient dewatering with the highest line loads. With the same nominal groove geometry in comparison to competitors, it can contribute to increased and at the same time long-lasting dewatering and improved dry content values.

This can be clarified on the basis of practical experiences clearly showing that the dewatering remains constant over the long running time. This is reflected toward the end of a sleeve period with demonstrably up to 1% more dry content.

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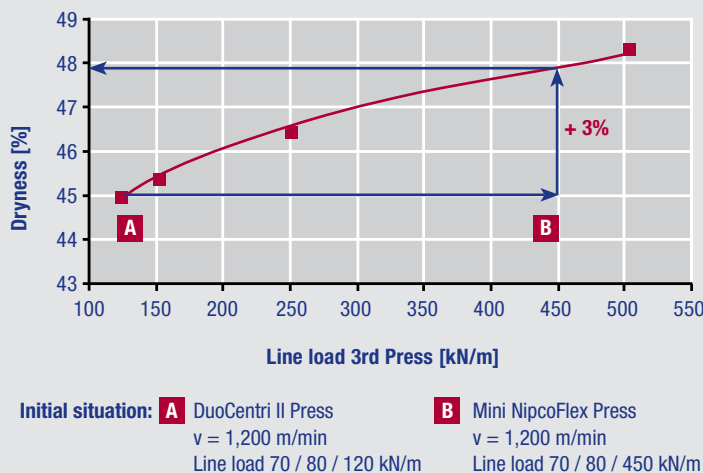


Fig. 2: Up to 3% increase in dry matter content possible.

Energy and financial effects for wood-free paper (80 g/m²) and a working width of 5,000 mm (nearly 200 in):

	Today	Mini NipcoFlex
Speed	1,200 m/min	1,200 m/min
Line load	70 / 80 / 120 kN/m	70 / 80 / 450 kN/m
Dryness	45%	48%
Steam consumption		- 115 t/day - 72,200 kWh/day
Electrical drive		+ 4,900 kWh/day
Sum		- 881,900 €/year

Fig. 3: Through use of the Mini NipcoFlex press, 881,900 euro can be saved annually.