

NipcoFlex

The next generation of paper dewatering

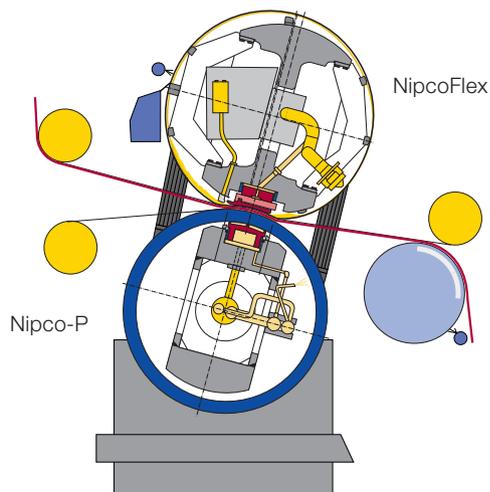




Symbiosis of proven technologies – The NipcoFlex press

The worldwide launch of closed shoe press technology by Voith set a milestone for efficient and gentle paper dewatering. After more than 10 years of successful operation of the FlexoNip and Intensa S press, these two very successful shoe press systems have been combined into a new, even better solution: the NipcoFlex.

Cross-section NipcoFlex module

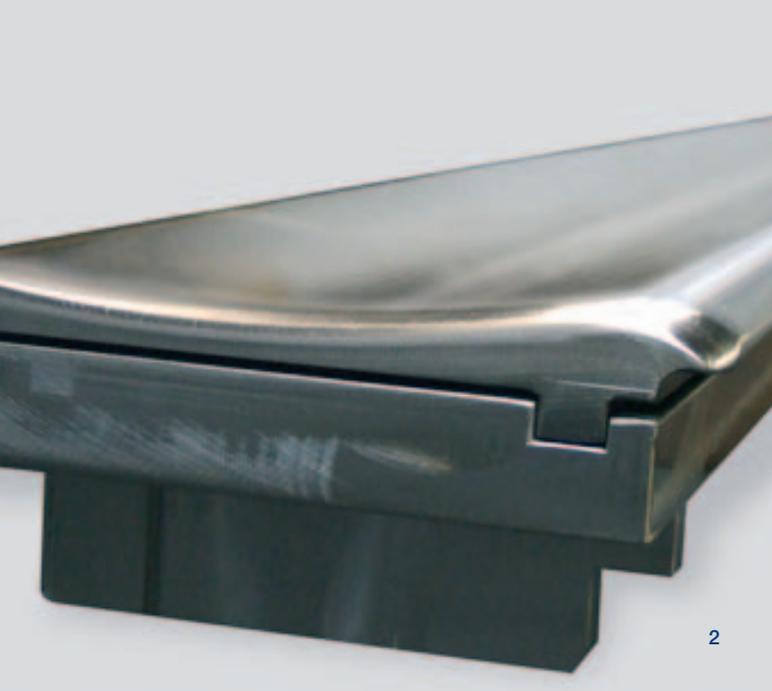


NipcoFlex presses

The fundamental technological advantage as compared to conventional press concepts, can be increased even further with several application variations. Depending on the requirements, different press concepts are available: Single, DuoCentri, Tandem configurations and other individual solutions.

Design and function

A NipcoFlex module typically consists of a NipcoFlex and Nipco-P roll. The NipcoFlex shoe presses stand out due to their simple, reliable design. This is characterized by an easy-to-open lock connection between the NipcoFlex and the Nipco-P roll, a combined supply with hydraulic oil as well as a single, foolproof connection of the NipcoFlex to the hydraulic system via the oil distribution head on drive side.



- 1 NipcoFlex loading unit
- 2 NipcoFlex pressure shoe

Technology and development

The decisive technological advantage of modern shoe presses is their high press impulse to the paper web. The combination of a long dwell time of the paper in the nip and optimal pressure gradients enables maximum production capacity at the highest quality level. This optimal loading for paper dewatering is made possible by the combination of a position-stable backing roll and a hydraulically loaded concave pressure shoe under a flexible press sleeve of the NipcoFlex roll. An extremely high press impulse is generated with an optimal pressure curve as a result of the contour of the pressure shoe. Depending on the required paper quality and furnishes, a classic or progressive pressure curve can be selected.

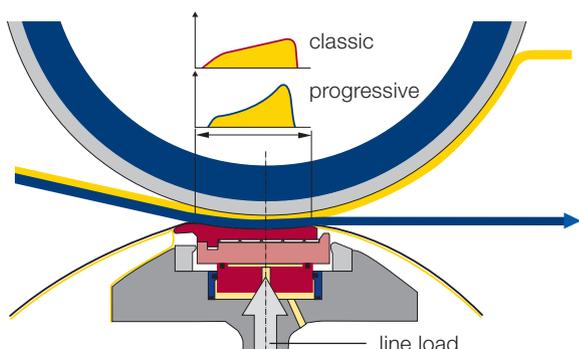
Through a pressure curve, which is optimized with regard to gradients and peak pressure, maximum dewatering with the highest quality is feasible.

An unbeatable combination

With NipcoFlex and QualiFlex, Voith centrally bundles all competencies regarding NipcoFlex technology. Besides the mechanical components, the QualiFlex high-capacity press sleeves complete the package for maximum performance. In addition, with the Service NipcoFlex, you have a central contact for everything you need regarding the NipcoFlex press.

Loading and pressure profiles

Pressure impulse = pressure x dwell time in the nip = linear load / web speed



Major advantages at a glance

- + Increase of specific production rate
- + Minimization of specific energy and production costs
- + Highest speed due to improved strength of paper web
- + High dry content due to efficient dewatering
- + Low pressure maximum with simultaneously high press impulse
- + Minimal two-sidedness and uniform moisture CD profile
- + Simple, reliable control and high runability
- + Several application variations and positioning

Overview of the NipcoFlex roll

1 QualiFlex press sleeves

Due to the concave pressure shoe contour and high loads in the press nip, the demands on a modern high-capacity press sleeve are manifold. Flexibility combined with high tensile strength and wear resistance are only two decisive factors. The surface pattern, the design and the press sleeve material are additional key factors for high dewatering capacity and life time. The innovative high-performance sleeves from Voith set standards in all applications.

Design and surfaces

The QualiFlex press sleeves are manufactured in a single pour process from an extremely resistant polyurethane matrix with non-woven yarns embedded. This manufacturing process allows superior strength and long life times of the QualiFlex press sleeves. Based on optimal surface pattern and material, maximum dewatering capacities and extended sleeve replacement intervals are achieved.

2 Cooling-oil distribution pipe

For cooling and lubrication of the press sleeve and the roll interior, oil is uniformly distributed on the outlet side over the entire roll width to the inside of the press sleeve.

3 Exhaust

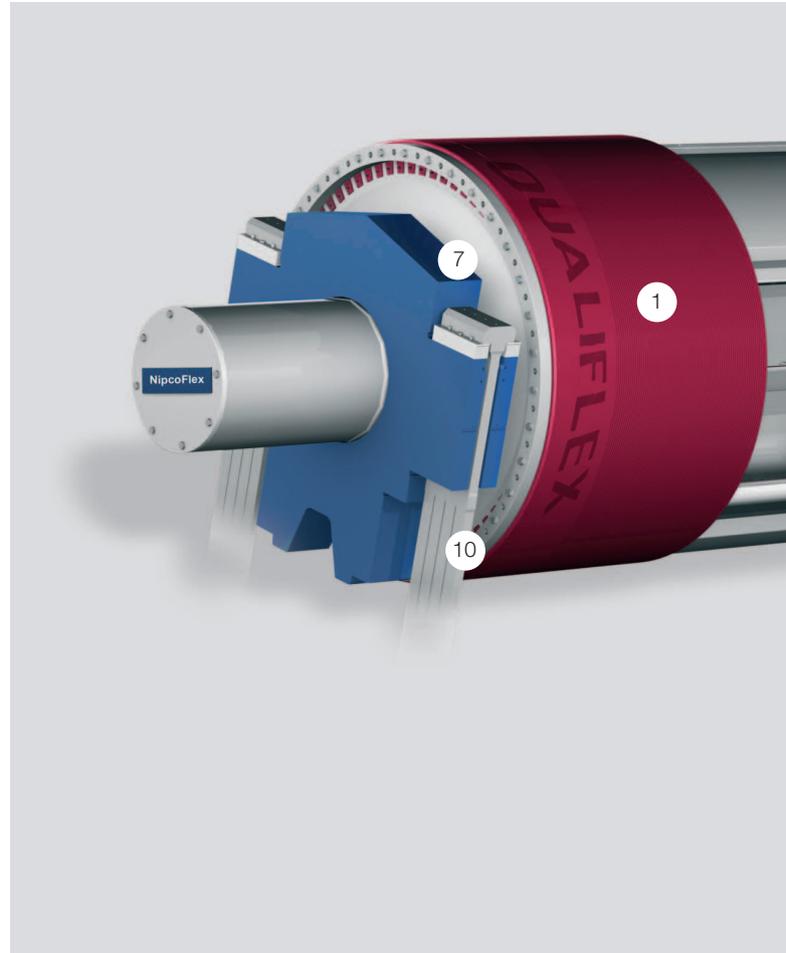
Based on the suction pipe principle, via the combination of overpressure in the press sleeve and vacuum in the exhaust system, the oil introduced through the cooling-oil distribution pipe and possibly the hydrostatic lubrication is drawn off out of the roll and led back into the hydraulic unit.

4 Oil distribution head

The task of the oil distribution head is to distribute the single cooling, pressure oil and air volume flows. Due to this removable connection and distribution system, which can be dismantled in one piece, foolproof decoupling and coupling of the roll to the external oil and blower system is ensured.

5 Supporting strips

Due to the flexibility of the press sleeve, it is necessary to stabilize the sleeve for operation with an internal overpressure. During shutdowns, supporting strips perform this task. The supporting strips also facilitate the installation procedure of the sleeve.

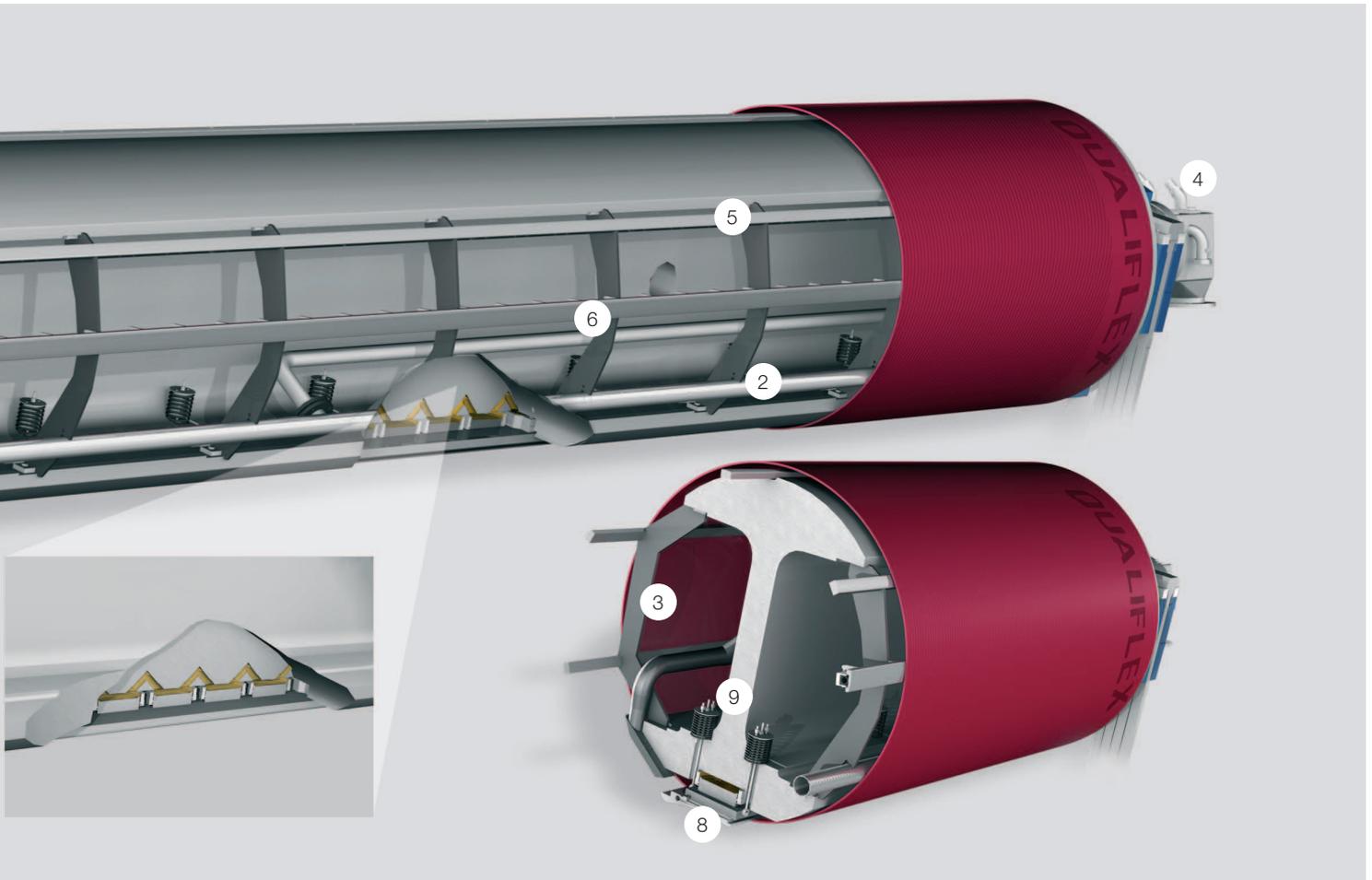


6 Pneumatic supporting strip

The pneumatic supporting strip is variable in its position and serves as an internal counter holder when an external water scraper is in use.

7 Clamping disks

The only rotating components of the NipcoFlex roll have the task of clamping the flexible press sleeve, thereby sealing the roll interior outwards and ensuring the axial tension of the sleeve. The excentric arrangement of the clamping disks produces an optimal geometric situation for the sleeve to enter the nip under minimal stress. Due to the possibility of axially shifting the sleeve with the aid of clamping disks, the sleeve life time can be further increased.



8 Pressure shoe

The pressure shoe is the heart of the NipcoFlex roll. Its contour permits an optimal pressure curve. The compound design with concave top part and carrier bottom part with an interposed thermal insulating layer guarantees optimal stiffness and minimal thermal deformation of the pressure shoe. Depending on the application, oil can be introduced directly into the press nip between the pressure shoe and the press sleeve via the so-called hydrostatic lubrication.

9 Loading and return

To achieve the high linear loads in shoe presses, the pressure shoe is pressed hydraulically with a cylinder piston system against the backing roll. The return of the pressure shoe is carried out by the expansion of the compressed springs with a pressure-less hydraulic system.

10 Locks

The locks connect the two rolls to each other and take up the enormous forces during operation. Thereby not only expensive framing constructions become unnecessary, but the press is also quick and easy to open.

Furthermore, the space-saving design allows optimal setting of the press to adapt to changing operating conditions. Example: distance of the axis. If the backing roll is reground, the position of the NipcoFlex can be adapted accordingly. This maintains the optimal ingoing situation of the sleeve into the nip, minimizing strains and maximizing sleeve life time.

Overview of the Nipco-P roll

1 Cover

The roll cover technology is a key factor for the dewatering capacity and cover service life. The innovative roll covers and roll coatings from Voith set standards in all applications. The range of covers extends from ceramic to rubber to the new stainless-steel cover G-Flex.

2 Roll shell

The position-stable bearing and hydraulic support of the Nipco-P roll shell permit thinner walls compared to other types of backing roll. Less shell deformation with simultaneously low weight is therefore ensured with a Nipco-P roll shell.

3 Oil cooling

Through an optional pipe-nozzle system, oil is sprayed over the entire width of the roll shell for cooling. Therefore, despite the high nip forces, detachment of the cover caused by increased temperature is prevented.

4 Oil return

The oil introduced into the roll is carried with the shell to the top due to centrifugal forces and scraped off at the hydrostatic pistons. Via discharge boreholes in the cross shaft, it flows into a drain pipe and through the drive-side journal back to the hydraulic unit. At the roll shell, a defined, uniform oil ring is formed over the roll width, thereby preventing the roll from filling up with oil. Losses due to whirling are minimized and the useful drive capacity is maximized.

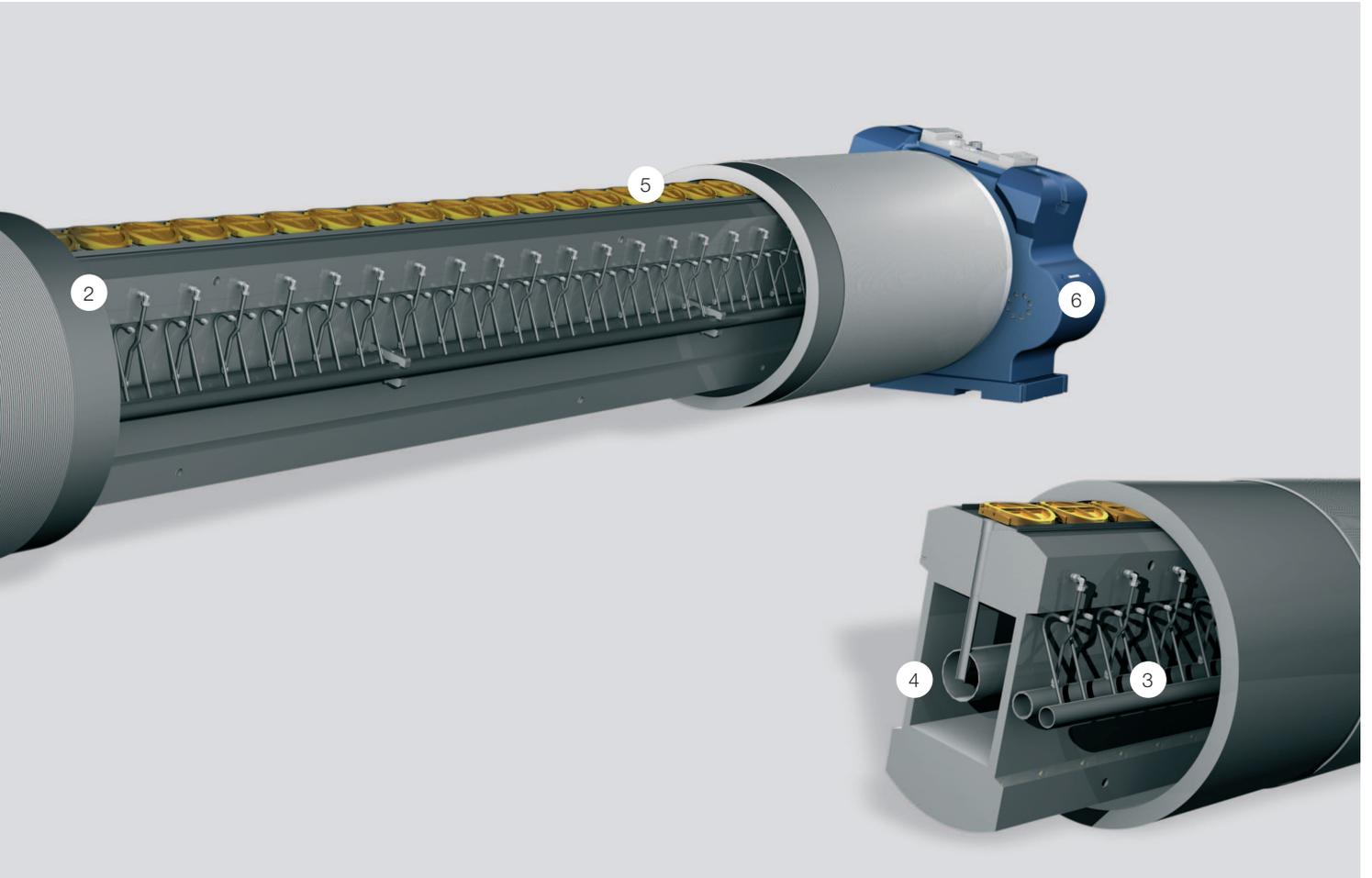
5 Hydrostatic pistons

The hydrostatic pistons are responsible for supporting the roll shell. The hydraulic loading takes place synchronously with the NipcoFlex roll, which is essential for the safe control of the NipcoFlex press in operation. Due to the integrated capillaries in the hydrostatic pistons, an oil film forms between the roll shell and the hydrostatic piston. Therefore, there is no direct mechanical contact. Hence, abrasion and wear are not a problem, and an additional cooling of the roll shell occurs.



6 Gear unit

In NipcoFlex shoe presses only the backing roll is driven. The rotation of the NipcoFlex roll is effected by the pressing of the press sleeve in the nip. The drive of the Nipco-P roll shell is accomplished by an electric motor, which is connected to a gear unit. The integration of this gear unit in the drive-side bearing housing not only saves space, but also time for roll changing. Via a coupling flange between the drive line and the input shaft of the gear unit, the entire Nipco-P roll can be decoupled from and coupled to the drive without time-consuming dismantling work.



Therefore, in the drive concept of a Nipco-P roll, there are excellent operating characteristics with regard to efficiency and vibration behavior combined with short maintenance times.

7 Support

With regard to the support, a differentiation must be made between cross-shaft and roll shell support. Both are supported separately from each other, but in one plane. Thus, the roll shell position is decoupled from the cross-shaft deflection.



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