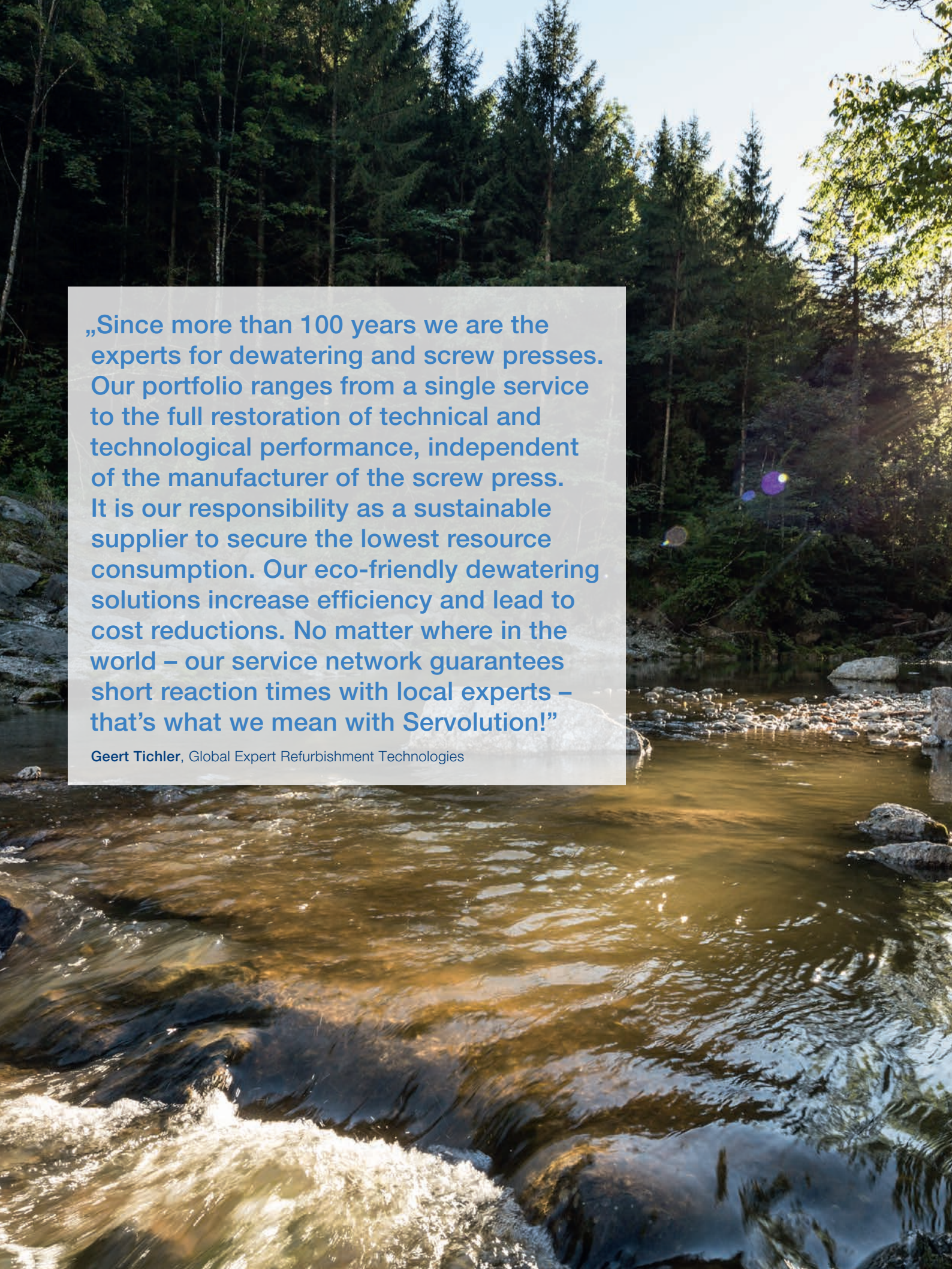


Efficient dewatering technology Screw press optimization service





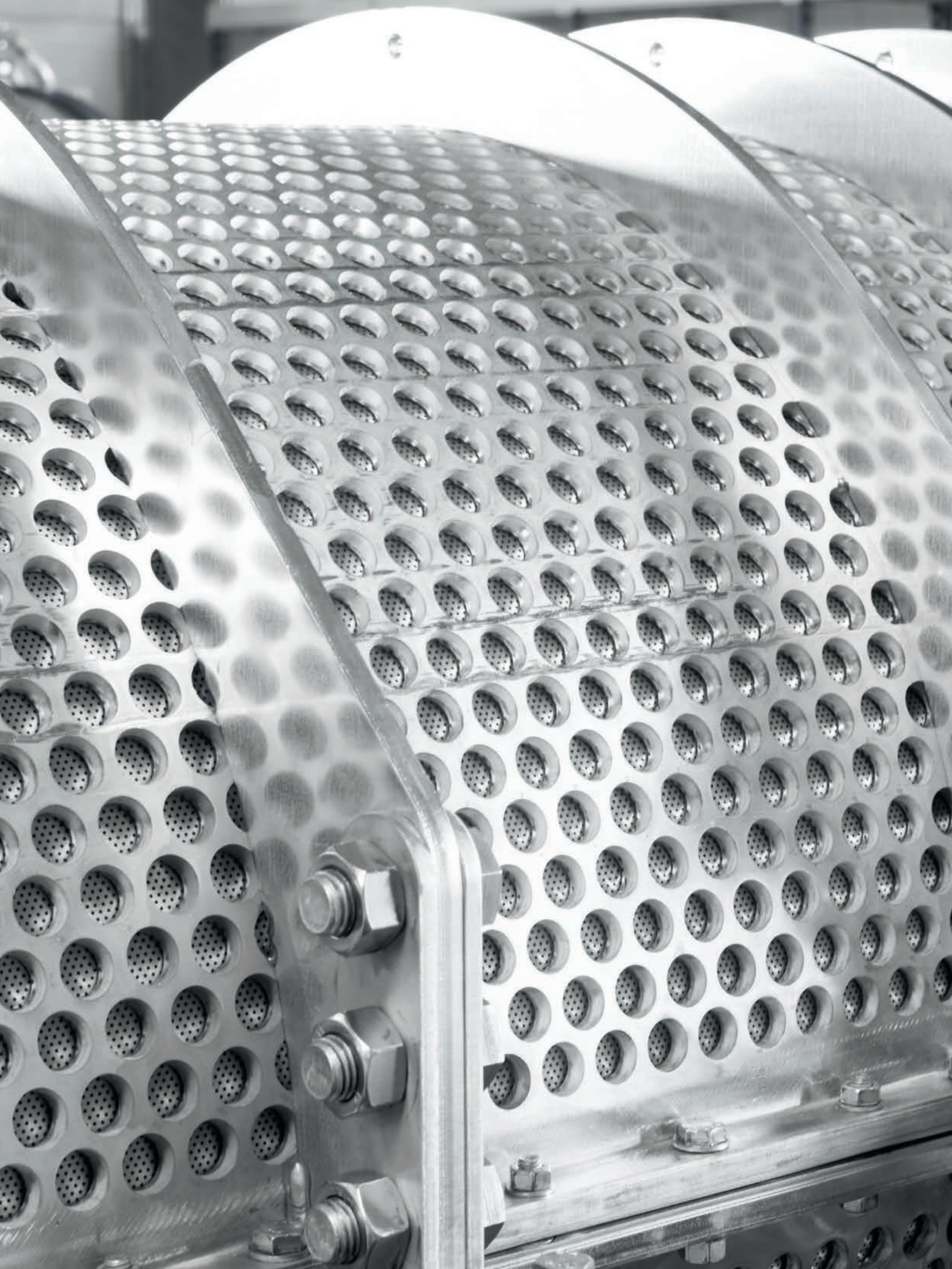
„Since more than 100 years we are the experts for dewatering and screw presses. Our portfolio ranges from a single service to the full restoration of technical and technological performance, independent of the manufacturer of the screw press. It is our responsibility as a sustainable supplier to secure the lowest resource consumption. Our eco-friendly dewatering solutions increase efficiency and lead to cost reductions. No matter where in the world – our service network guarantees short reaction times with local experts – that’s what we mean with Servolution!”

Geert Tichler, Global Expert Refurbishment Technologies



Table of content

Introduction	5
InfiltraScrewpress	6
Thune Screw press	8
Signs of a worn screw press	11
Our 24/7 customer service	12
Overview of our service portfolio	14
Repair and refurbishment	16
SmartGrinder	18
Overhaul of complete screw press	20
Upgrades and rebuilds	22
Exchange of existing press screw wing geometry	24
Rebuild to SplitScreen	25
Upgrade to FreeFlow	26
Rebuild to Wearless segments	27





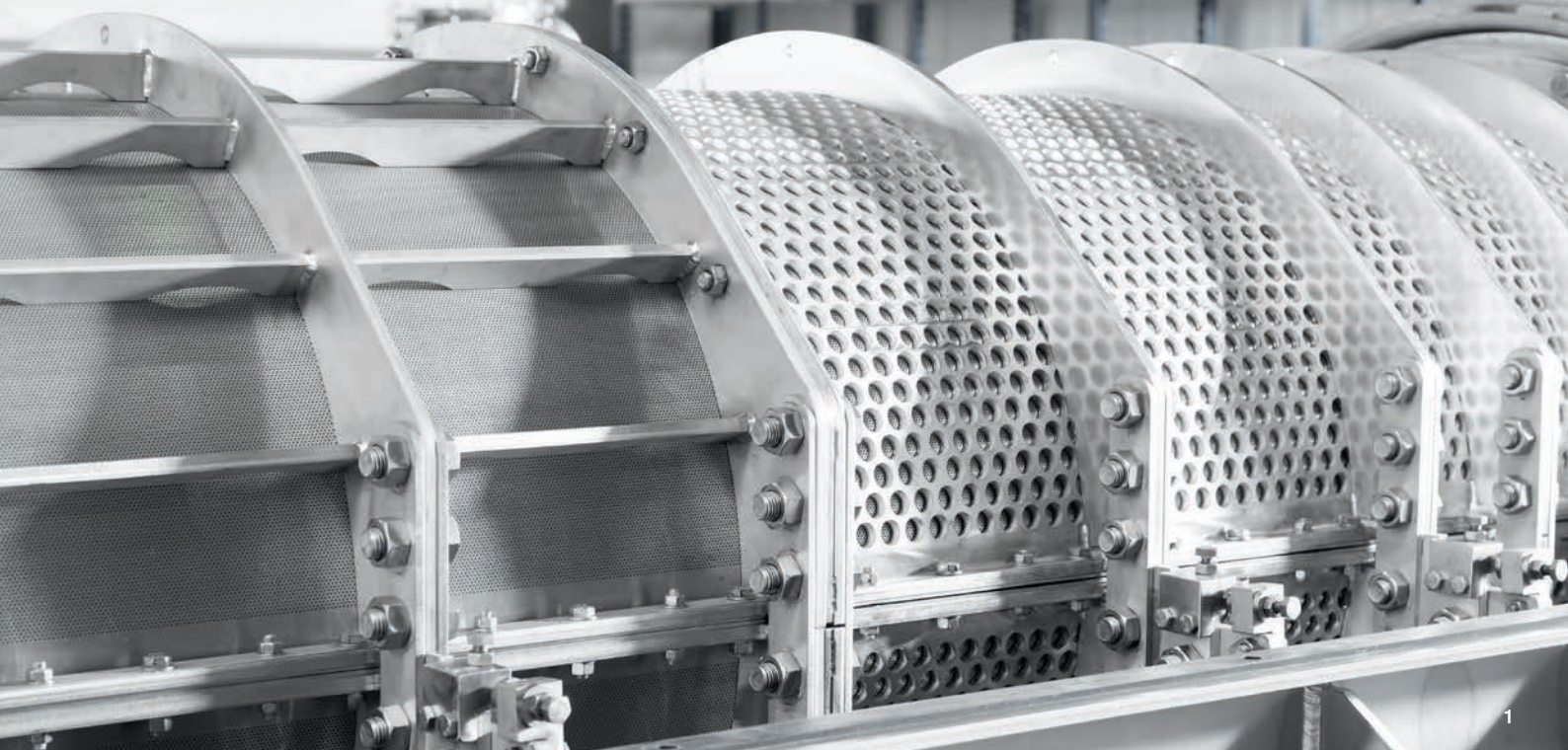
Optimally dewatered pulp, sludge or reject with screw presses

The screw presses for virgin and recovered pulp applications are installed as key components for stock dewatering, washing processes and water circuit separation processes. At Voith we offer two types of screw presses: the InfiltraScrewpress and the Thune Screw press.

Regular maintenance and servicing is required to ensure that the dewatering performance of your screw press is always optimal. Our service portfolio includes not only the maintenance of fiber screw presses but also various services for reject and sludge screw presses. These services call for experts who are very familiar with this process step. In addition, ideal maintenance can optimize the overall performance of your screw press.

On the following pages we will give you an overview of our screw presses and our service portfolio – so that you always receive a perfect dewatering result regarding stock consistency and capacity.

We offer expert services for all fiber, sludge and reject screw presses from Voith and other OEM manufacturers.



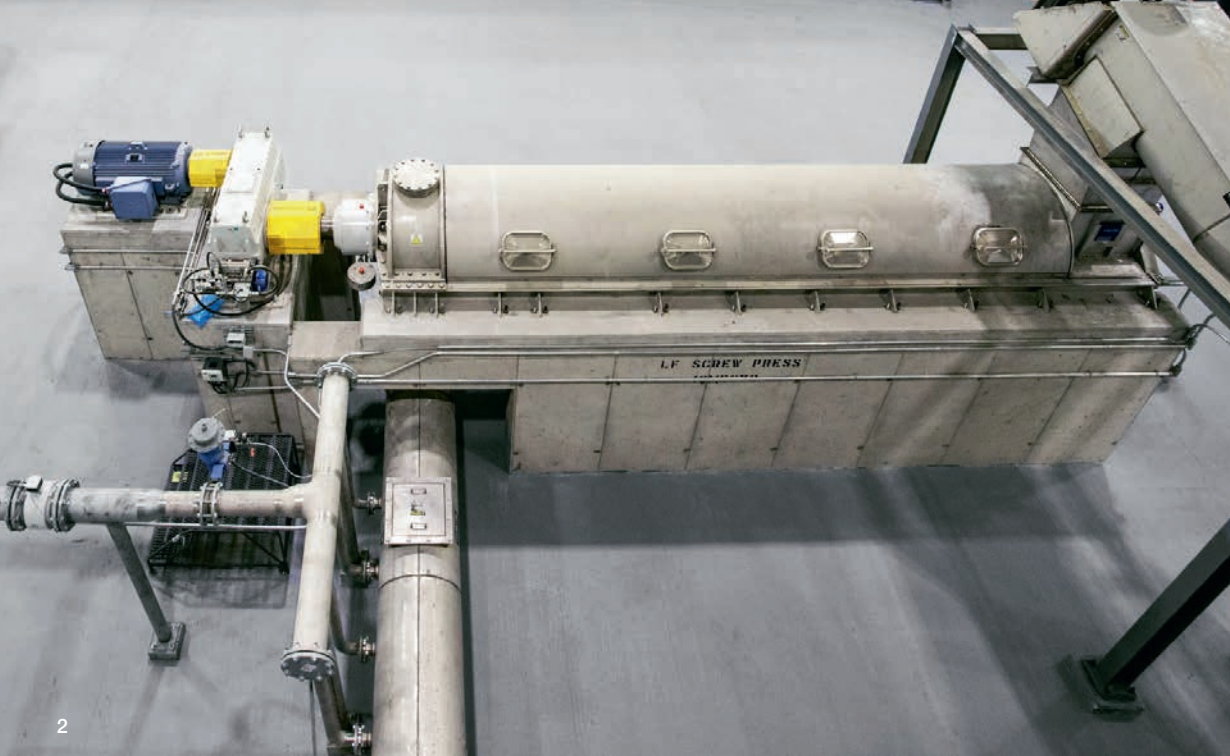
High dewatering performance InfiltraScrewpress

The InfiltraScrewpress impresses with its high dewatering performance, improved energy efficiency and low maintenance outlay. As part of Voith's Compact Dispersion System it has been successfully in operation at a number of paper manufacturing sites.

The InfiltraScrewpress boasts a design that is more than ten times stiffer than comparable machines, complementing its low center of gravity. This ensures the machine's very tight tolerances over the entire operation cycle, allowing high dewatering performance and minimal fiber loss to be achieved.

The press screw is customized depending on application for optimal high outlet consistency. The fiber suspension is fed into the screw press at a stock consistency of 4 – 12 % and is then transported by the press screw in axial direction.

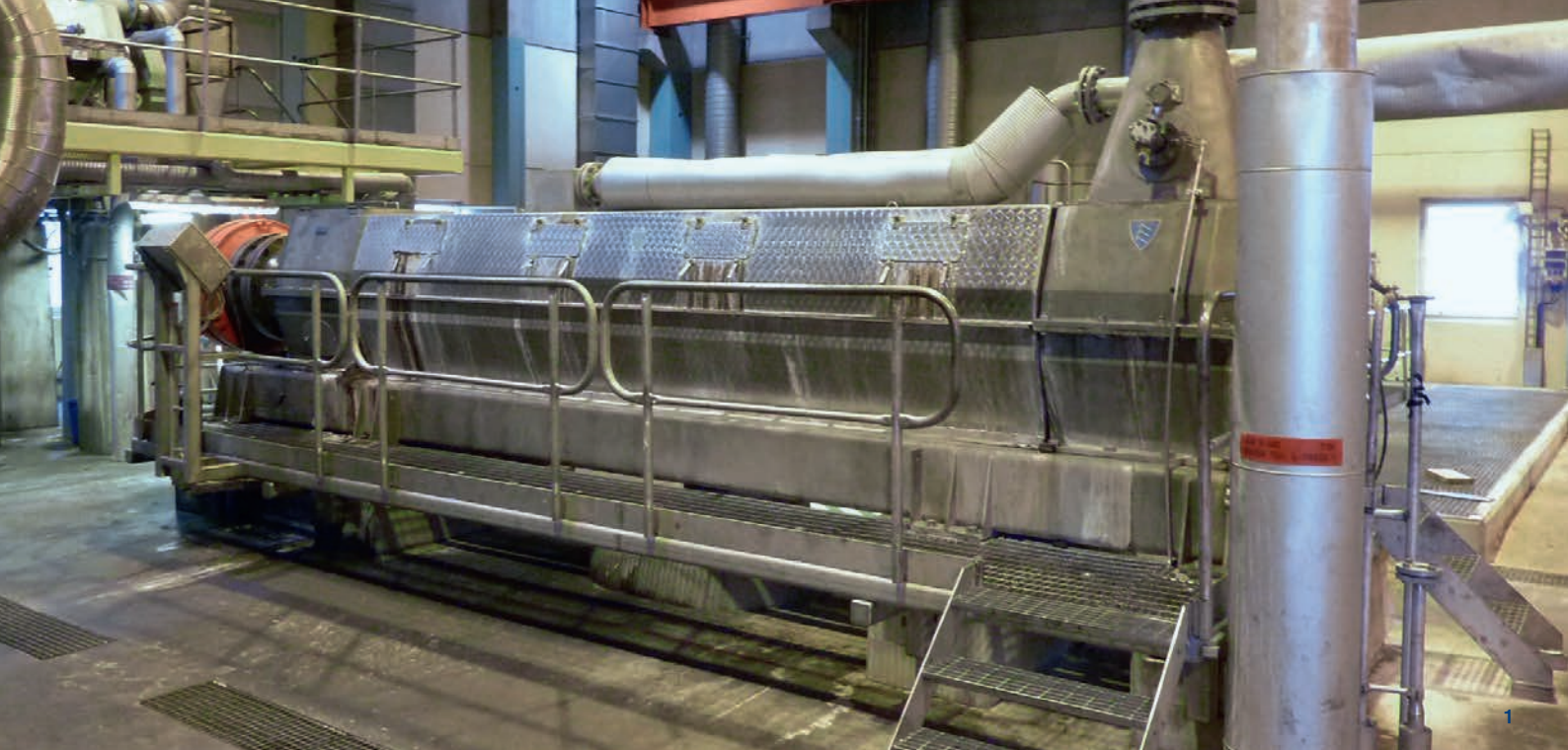
The suspension is thickened by the constricting volumes between press screw and screen baskets. Excess water is discharged via the screen baskets. The filtrate can thus be pressed out of the suspension and discharged via the screen baskets of the new SplitScreen screen elements.



- 1 InfiltraScrewpress with SplitScreen screen elements
- 2 InfiltraScrewpress

Your benefits with InfiltraScrewpress

- + High dewatering performance and low energy consumption
 - + Customized press screw for high outlet consistency
 - + Minimum maintenance required as the press screw of InfiltraScrewpress is provided with a wear-protection coating
 - + The patented screen element SplitScreen has a removable design which allows the replacement of the bolted screen plate without having to replace the entire screen element
 - + The low center of gravity for the screw press guarantees very tight tolerances between the screen and the press screw during operation
-



An excellent choice for pulp dewatering Thune Screw press

The different capacities of each Thune Screw press, varying from 10 to 1 000 metric tons/day with discharge stock consistencies of around 30 %, ensure excellent dewatering performance for many different operating conditions. The screw press can be used for a variety of dewatering and washing applications in mechanical, recycled and chemical pulp processes. Voith has experience with all relevant pulp and paper applications and has been the market-leading supplier of screw press technology since 1919.

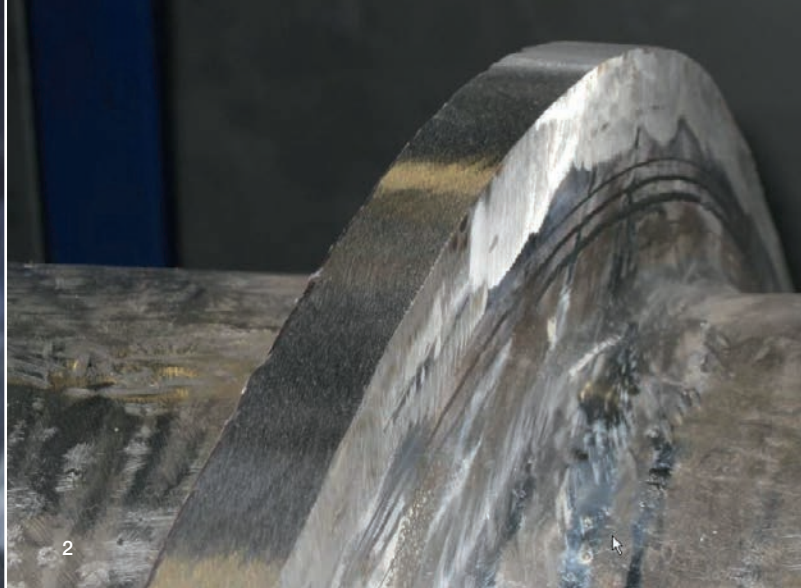
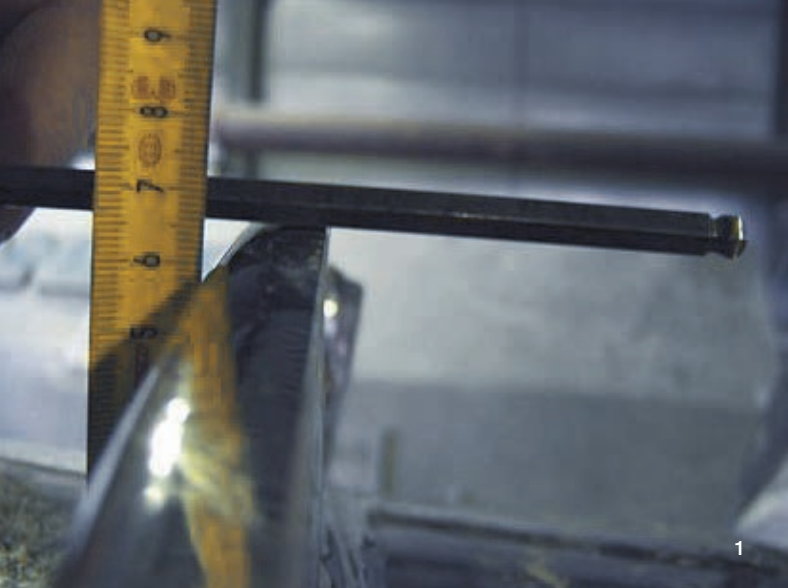


1 Thune Screw press in a pulp mill

2 Pulp

Your benefits with Thune Screw press

- + The pneumatic counter pressure system features pistontype individual baffles; this combined with a mechanically adjusted cone ring ensures a highand even discharge consistency
 - + The drill pattern of the screens and the close tolerances between the screw flight and the screens prevent blocking
 - + Improved hard facing on the screw flight significantly reduces wear
 - + The splitted screen in the high compression zone enables easy screw flight inspection and maintenance
 - + The shaft screen in the high compression zone increases and evens out the discharge consistency
 - + The screw press is equiped with a mechanical drive
 - + The press screw geometry is customized for different pulp types and applications
 - + Automatic torque control regulates screw speed according to the process variations to keep a high and constant discharge consistency
-



Wear and it's influence to the screw press performance

Signs of a worn screw press

As the operating time between the service intervals progresses, screw flights, screw stem and screens are subject to wear, losing geometry. Gradually reducing the dewatering performance to the extent that the required outlet consistency and capacity can not be reached anymore. Allowing a stable and efficient dewatering process ensuring that your machine delivers the optimum results, in time restorations from wing profile, screw diameter, and screen basket profiles is required. If the screw press is not serviced in time, defects will occur which have a negative influence on your screw press performance.

Typical signs of a worn screw press

- Reduced outlet consistency
- Reduced capacity
- Speed increase
- Increased torque
- Increased fiber content in filtrate
- Difficulties to stabilize the process
- Shaking
- Insufficient cleaning of screens
- Plugging
- Pulp co-rotation
- Spitting
- Fiber jamming

- 1 Long experience with all wear patterns
- 2 Sharp screw flight edge
- 3 Voith experts working on a screw press

The solution

Our 24/7 customer service – there for you worldwide!

In order to avoid and prevent these defects and further damage, we offer a comprehensive service for the complete screw press. Regardless of the manufacturer, our service experts get the best out of your system.

With more than 100 years of dewatering experience, you can completely rely on our know-how for screw presses. We offer full restoration of technical and technological performance, independent of type, or manufacturer or dimensions. Our worldwide service network guarantees local contact persons for our customers and thus short reaction times in emergencies.

The following list gives you an overview about our service portfolio. Please have a look at the following pages to see more details regarding the individual offers.

Service portfolio

- Full service contracts
- Complete machine overhauls
- Single screw press refurbishments
- Analysis and trouble shooting
- Digitalized condition monitoring
- Upgrades and modifications
- Screen basket repairs
- Rebuild to SplitScreen
- On-site screw press refurbishments
- Mechanical on-site services
- Workshop repairs

Voith repair workshops worldwide

With 20 service hubs strategically located around the world, our global service network is offering a wide range of customized services with high caliber local expertise.

Independent of the manufacturer, type or size from the screw press. In addition is the service oriented infrastructure ensuring short reaction times and local contact persons.

Global footprint



Audit

Restoration of original geometry

Optical evaluation of screw press condition. All fiber, sludge and reject screw presses from Voith and other OEM manufacturers.



Repair and
refurbishment

Voith workshop or direct at the mill on-site

- **Condition monitoring**
 - Analysis and trouble shooting
- **Repair and refurbishment press screw**
 - geometry restorations screw stem
 - hardsurfacing
 - grinding outside diameter
 - exchange of wearless segments
- **Coating of press screw**
 - According to Voith latest technology
- **Screen basket refurbishment for screw press**
- **Overhaul of complete screw press**

Your benefits

- + Restore design performance
 - + Ensure optimal operating parameter for subsequent systems
-



On-site service



24/7 customer service

Technological optimization



Upgrades and rebuilds

Voith workshop or direct at the mill on-site

- **Exchange of complete press screw**
 - Changed wing geometry (height or pitch)
 - higher capacity or
 - different raw materials
- **Modification of existing press screw wing geometry**
 - Rebuild from SingleFly to DoubleFly wing or vice versa for
 - modified capacity or
 - different raw materials
- **Rebuild to SplitScreen**
 - Improved dewatering performance
 - Less time-consuming disassembly
 - Quick replacement of the SplitScreen plates
- **Rebuild to FreeFlow**
 - Especially designed wing shape for
 - higher capacity OR reduced energy, depending on application
- **Rebuild to Wearless segments**
 - higher runtime
 - screwed (not welded), for an easier exchange

Your benefits

- + Capacity increase
 - + Energetically optimization of subsequent dispersion system (less KW/t)
 - + Adaption to new requirements
 - + Change of raw material (furnish)
-



Voith repair workshops worldwide



Repair and refurbishment

Screw press refurbishment services Restoring design performance

The aim of our screw press service is to achieve optimum dispersion results through continuous and constant high stock consistency.

Optimal screw press performance determines the quality of your product and/or the cost of running your plant. As a professional and reliable partner we offer cost-effective solutions for press screw refurbishments, restoring design performance, achieving an optimum balance between operating cost and technological performance. Assessment of the presses' performance during operation supplies valuable information about the wear status of various parts.

As the condition of the screws, screw stem, screen baskets and possibly fitted wear-elements have a major influence, the timely planning of their repair is important. We offer the full scope from assessment to either on-site repair or exchange of the screw with subsequent repair in our workshop. The option chosen depends on both downtime and cost considerations.

Screw press refurbishments always starting with a detailed, digitalized assessment from wear pattern and shaft conditions by highly skilled personell to determine the required repair procedures, materials or combinations to be applied. Often followed by advices towards reaching the optimum in service intervals and optimizing operational costs. The actual repair is carried out by applying specifically developed welding and coating materials, with optimum material properties specifically developed to increase performance and lifetime from your equipment.

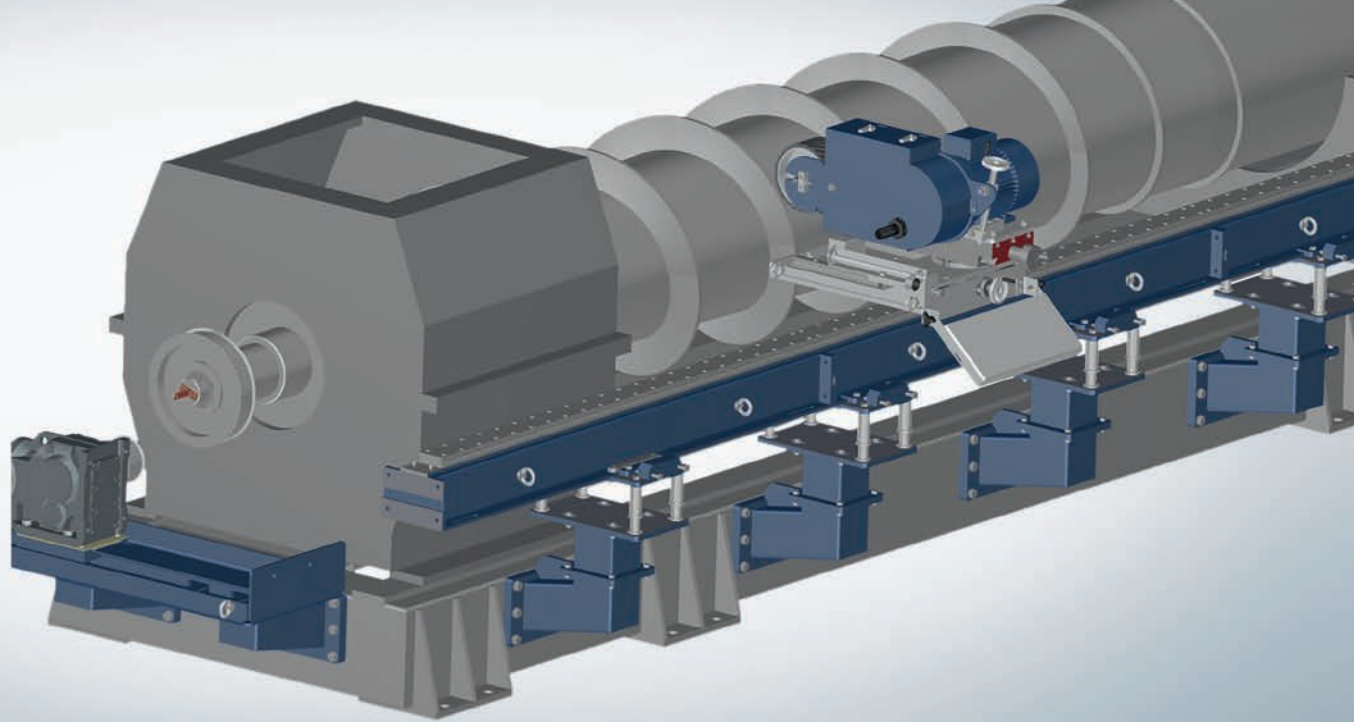
The equipment is specially made to machine the screw to its required dimensions. We can simulate the operating condition from the screw press allowing the most accurate restoration from the flight and screw stem geometries.



Refurbishment of a press screw
in a Voith workshop

Your benefits with our screw press refurbishment

- + Review process log and refurbishment history
 - + Detailed digitalized analysis wear pattern and shaft condition
 - + Refurbishment carried out according to technological demands
 - + Application of the latest Voith welding and coating technology for improved performance and longer life
 - + Highly skilled and experienced personnel
 - + Specifically developed workshop equipment for high accuracy using manual and automated welding and grinding techniques
 - + Maintained and improved press screw performance
 - + Application proven repair procedures
 - + Vastly improved dimensional accuracy compared to manual repair
 - + Door-to-door service
 - + Advice and recommendations on optimum service intervals optimizing operational costs
 - + Consultation on press screw operation
 - + Periodic inspections to monitor the dewatering
-



Outstanding services directly at your machine SmartGrinder

Thanks to our on-site service, our customers save valuable time and money as no parts have to be removed, reinstalled and laboriously shipped. Our experts come directly to you at the plant, equipped with years of experience and state-of-the-art technology. Our SmartGrinder is a modular system, set up according to size and requirement while your screw press is in operation, minimizing down time and production losses. After the first service the SmartGrinder can be replaced even faster, as the assembly plates will remain. Besides are all new screw presses foreseen of the designated assembly plates allowing fast and specialized Voith on-site services.

Before processing with the actual repair, a detailed digitalized condition measurement from the screw stem and flights will be conducted. This allows a professional analysis from the existing wear pattern, indicating the areas which require additional attention. Our SmartGrinder is allowing a fast and high accurate diameter restoration, by a clever design. This enables our SmartGrinder to exactly follow the flight geometry, saving valuable shutdown times up to 20 % faster than conventional repairs. As our service provides the flights with the required sharp edges, this results in an optimum removal from the fibermat. In addition Voith is offering a regular on-site monitoring which can maintain and even improve the performance of your screw press.



**Voith SmartGrinder for
best refurbishment services
at the screw press**

Our scope of work

- Performance monitoring during operation
- Review process and maintenance log
- Install SmartGrinder during operation
- Modular set up according to size and requirement
- Own drive
- Digitalized measurement and condition control
- Professional analysis of existing wear pattern
- Restoring design geometry
- Apply new technology hard faced welding
- High accurate diameter restoration by SmartGrinder
- Apply wear resistant anti friction coating
- Installation of Wearless segments, rebuilds and modifications on request
- Supervision during startup

Your benefits with our on-site service

- + **No screw disassembly required**
 - + **No spare screws required**
 - + **No laborious screw transportations**
 - + **Workshop accuracy on-site**
 - + **Full restoration of screw performance**
 - + **Reduction of down times by the use of our SmartGrinder which leads to 20 % faster repairs than conventional methods**
 - + **Increased life time and therefore longer service intervals**
 - + **Applicable for all makes and types regardless of manufacturer type and size**
 - + **Fully digitalized**
-



Get the original status back again Overhaul of complete screw press

As all rotating equipment in your stock preparation, also screw presses require overhauls. Besides the in time replacement from the critical wear parts, from time to time larger overhauls preventing unscheduled shutdowns and faultless operation.

As OEM manufacturer, Voith is offering a comprehensive mechanical service stretching from an on-site performance monitoring to a complete overhaul from your screw press. This can be done upon your demands either on-site, or executed within one of our service locations.

Ready to go – a restored
screw press

Your benefits with our screw press overhauls

- + Complete mechanical overhaul, restoring all relevant parts
 - + Bearings changes
 - + Wear segments replacement, screens, rebuild to SplitScreen, inspections during operation and shut down
 - + Performance monitoring during operation indicating necessary service interval
 - + Re-aligning drive coupling, inlet outlet housing
 - + Check condition all wear-parts
 - + Rebuild to Wearless segments
 - + Specialized service experts
 - + Wear sleeve replacements
 - + Supervision service
 - + Trouble shooting and repairs
 - + Mechanical upgrades
-



Upgrades and rebuilds

Screw press adaption according new requirement Technological optimization

Our upgrades and rebuilds are aimed at adapting capacity, enabling a change of raw material, e. g. to furnish or a different grade, and energetically optimizing the subsequent dispersion system.

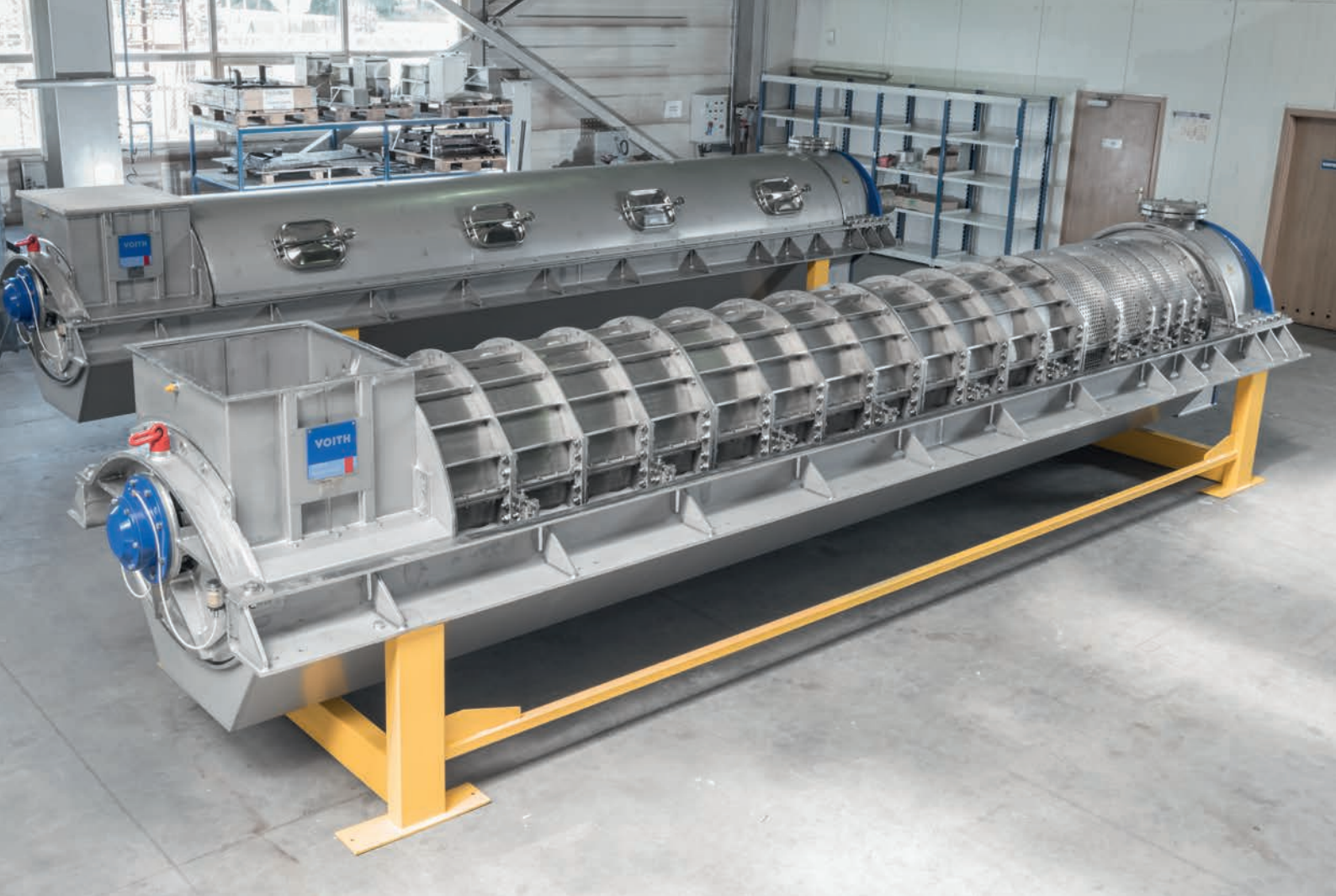
Changes in the dispersion requirement in terms of stock quality or energy savings have a direct effect on the screw press. Also raw material changes up to grade changes or capacity adjustments make an optimization of the screw press necessary.

For this purpose we have a comprehensive toolbox at our disposal. It is important to use it optimally in order to offer the most efficient and cost-effective solution for the customer.

Besides Voith Screw presses, machines from other OEMs are also optimized and modified from our toolbox. The contents of this toolbox are described in the following pages.

Toolbox for upgrading the screw press depending on customer target

- Exchange of complete press screw according latest sizing tool or modify the wing geometry
- Rebuild to SplitScreen
- Upgrade to FreeFlow
- Rebuild to Wearless segments, available in basic or premium quality



InfiltraScrewpress

Your benefits

- + Capacity increase
 - + Energetically optimization of subsequent dispersion system
 - + Adaption to new requirements
 - + Change of raw material possible
-



Exchange of existing press screw wing geometry

Adapting to new requirements

The press screw is the heart of every screw press and is responsible for the technology and capacity. If the requirements regarding technology or capacity change, the press screw must be replaced or adapted. The design of the required geometry is based on many years of experience according to proven design guidelines. The result is the press screw wing geometry in terms of pitch and height of the screw helix.

After the geometry of the optimized press screw has been determined, the most cost-effective variant – new press screw or modification of the wing geometry – is determined using modern design-to-cost methods and offered to the customer. It goes without saying that each modified press screw is as good as new in terms of quality and service life through appropriate reconditioning as described above.

Your benefits with a adapted press screw

- + Optimized high outlet consistency
 - + Adapted capacity according requirements
 - + Stable running conditions
 - + Reduced energy consumption due to operation in the optimum layout range
 - + Long lifetime due to modification on state of the art
-



- 1 Modified press screw
- 2 SplitScreen from Voith
- 3 Easy exchange of screen plates

Improve dewatering performance

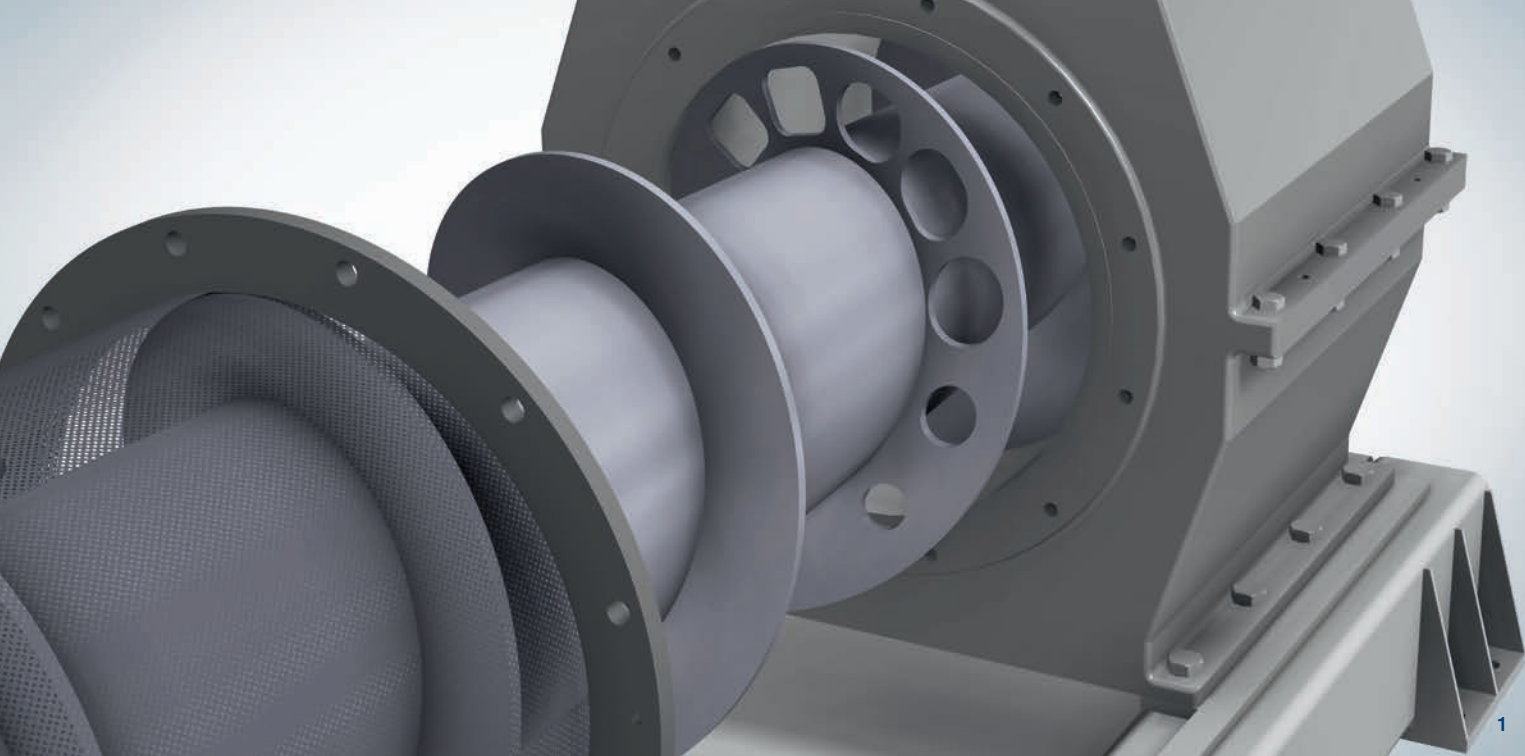
Rebuild to SplitScreen

The SplitScreen screen elements feature improved dewatering performance and markedly greater ease of maintenance. Its special design allows quick replacement of the SplitScreen plates without time-consuming disassembly of the entire screen element. Additional maintaining of the press screw with the wearless segments is more easy, because accessibility is clearly improved.

The SplitScreen screen element is used in all new Voith InfiltraScrewpresses, but can also be installed into existing screw presses from Voith and other OEMs as part of a rebuild package.

Your benefits with SplitScreen

- + **Highly improved maintenance efficiency**
 - + **Optimal access to press screw**
 - + **A constant gap between screen and press screw ensures a stable dewatering efficiency and low wear level**
 - + **Low maintenance cost due to easy exchange only of the screen plates not the complete basket**
-



- 1 Eliminate inlet pressure with FreeFlow
- 2 Wearless segments from Voith

Upgrade to FreeFlow

When your screw press capacity is a bottle neck in your production requirements, the rebuild to FreeFlow can be the answer. By adapting the flow in the inlet zone thru specifically calculated, designed and positioned openings in the screw flight, a FreeFlow from the stock suspension towards the mid pressure dewatering section is achieved. This eliminates the need to have inlet pressure and increasing capacity up to 10%, under very stable running conditions. This results in less plugging, cleaner filtrate and more consistent outlet consistencies.

Applicable to

- All stock preparation lines, for all grades, for screws operating with inlet consistency < 5.5 %
- Screw sizes starting from size SP70
- All makes and types independent of the manufacturer

Your benefits with our FreeFlow rebuild

- + Capacity increase up to 10 %
 - + Eliminating inlet pressure
 - + More consistent outlet consistency
 - + Stable operation
 - + No plugging
 - + Cleaner filtrate
-



2

Rebuild to Wearless segments

As the performance from your screw press is highly influenced by the condition from the screw flights, maintaining the sharp edges and diameter from the flights is one of the main contributors to your screw press performance. Rebuilding your screw press to Wearless segments not only increases the operating time between the required service intervals, reducing the downtime for on-site repair, but also enhances the overall screw press performance.

The bolted construction allows simple and quick in on-site replacements without laborious welding and grinding activities. Wearless segments are available in basic and premium version for all Voith SP and ISP sizes and also for other OEM to be rebuild to the bolted design for simple and quick exchange.

Your benefits with our Wearless segments

- + **Exact diameter restoration**
 - + **Bolted construction ensures simple and quick on-site replacement**
 - + **Enhanced screw press performance by maintaining required diameter tolerances**
 - + **High wear resistance**
 - + **High impact strength**
 - + **No build up of pulp**
-

How can we support you?
Just contact us via our
webform.



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