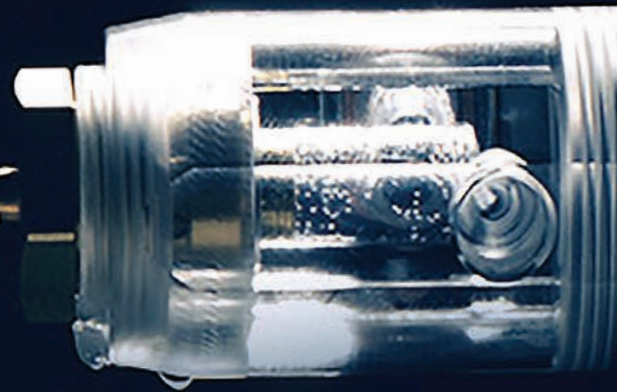




PULP & PAPER

EFFECTIVE FIBER AND ENERGY SAVINGS

VIB SYSTEMS



ANDRITZ

ENGINEERED SUCCESS

The ANDRITZ VIB advantage

Since 1922, VIB has been the industry's recognized leader in the area of precision fluid application for the paper industry.

As an expert in moisture control and profiling, ANDRITZ supplies optimized systems using both water and steam that are customized to each client's unique machine, operating and grade structure. To remain competitive in a challenging market, it is essential for paper machines to increase productivity and runnability.

Improving the sheet's cross-directional moisture profile has been demonstrated as being one of the most effective and economical means of saving fibers and energy and of improving overall quality levels. Paper-makers understand that there is no single, optimum solution to both increase efficiency and enhance

final paper quality. However, partnering with ANDRITZ to identify the most cost-effective means of achieving an even level sheet moisture profile throughout the length of the machine can ensure a rapid return on the investment.

Since joining ANDRITZ in 2018, VIB systems has entered a new phase. VIB continues to bring innovative profile control solutions to the industry by leveraging the global expertise of ANDRITZ engineering, application and design teams.

VIB SPRAYTECH

Paper moisturizing by using VIB spray technology is a proven and cost-effective means of improving quality in both on-line and off-line processes. The innovative dual-phase nozzle, utilizing air atomization technology to deliver a full-cone spray pattern, delivers one of the smallest droplet sizes available. From fine paper to paperboard, from moisture profile control to enhanced surface applications, each VIB spray system is custom-engineered to ensure the highest level of performance for your unique application.

VIB STEAMTECH

ANDRITZ offers steam-profiling solutions that encompass the entire machine, from the forming section to the final nip. Your particular target application, combined with our industry-leading expertise, determines the assignment location and type of system to meet your efficiency and quality targets. The VIB SteamTech product family of profilers includes innovative solutions for the wire and press sections as well as customized solutions for precision steam-finishing at the dry end of the machine.



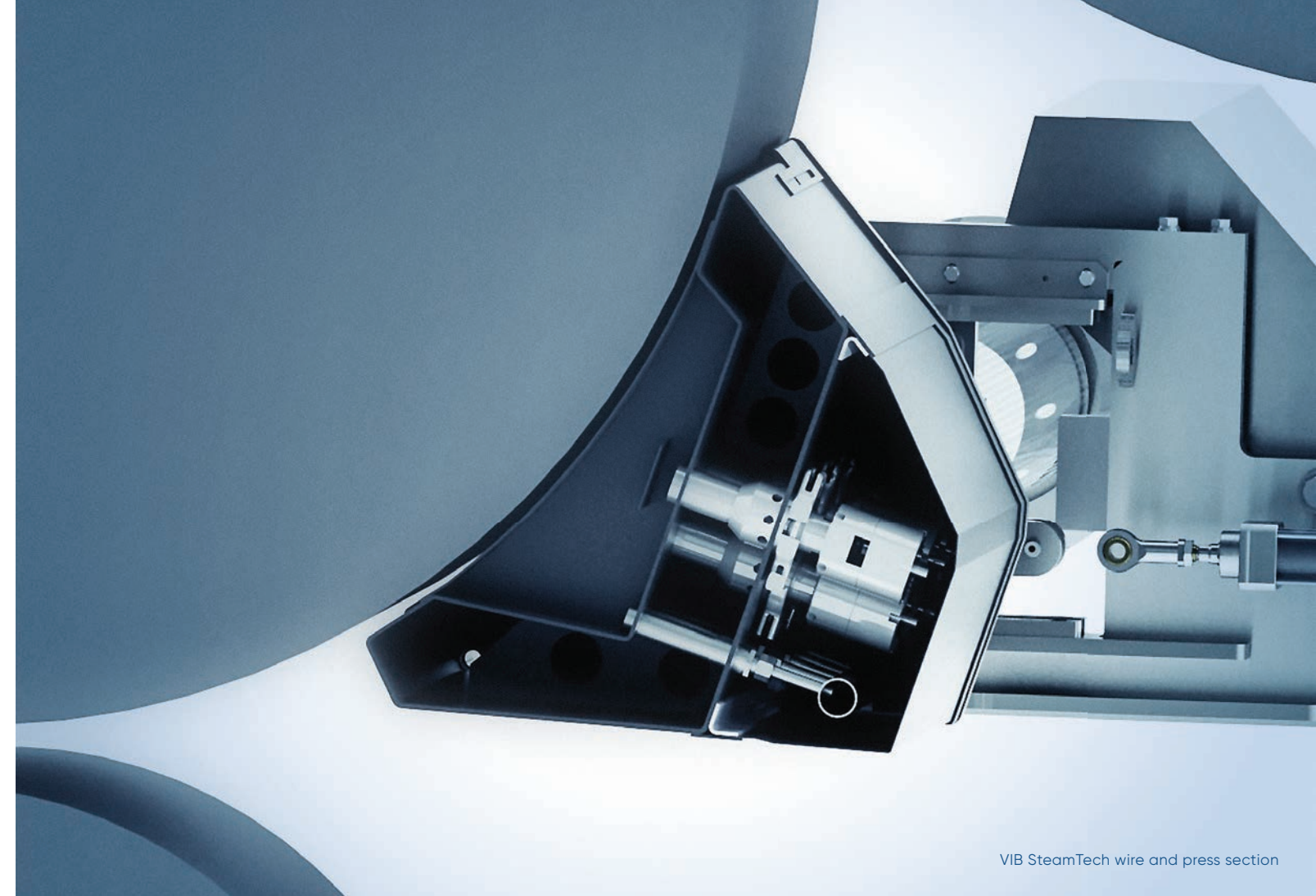
VIB SteamTech solutions for wire section, press section and finishing

WIRE AND PRESS SECTION SOLUTIONS

A properly installed and application-matched steam profiler at the wet end of the machine offers solutions to eliminate poor cross-directional moisture profiles and also increases the dry content leaving the press section. VIB steam profilers are fully compartmentalized, supplying high-velocity steam to each cross-direction zone through uniquely designed actuation valves that allow optimum zone definition along with precise control.

VIB STEAMTECH

- Increasing press section exit solids while eliminating moisture streaks
- Production efficiency gains due to improved transfer from the press section
- Rapid ROI due to dryer section steam savings and improved reel build
- Perfectly balanced to raise the dry content when the web enters the first press section
- Eliminating the trade-off between production increases and profiling capability
- Narrow actuator spacing down to 75 mm to match profile requirements



VIB SteamTech wire and press section

FINISHING SOLUTIONS

The production and quality improvements afforded by VIB steam profilers do not end after the wire and press sections. On the contrary, they are only just beginning. By carefully optimizing the relationship between surface moisture content, temperature, sheet properties and finishing equipment, an entire area of precision steam-finishing opens up numerous opportunities.

VIB SMOOTHTECH

- Innovative wedge-shaped profiler for on-/off-machine calendering applications
- Controlling two-sidedness with independent top and bottom side actuators

VIB MOISTURETECH

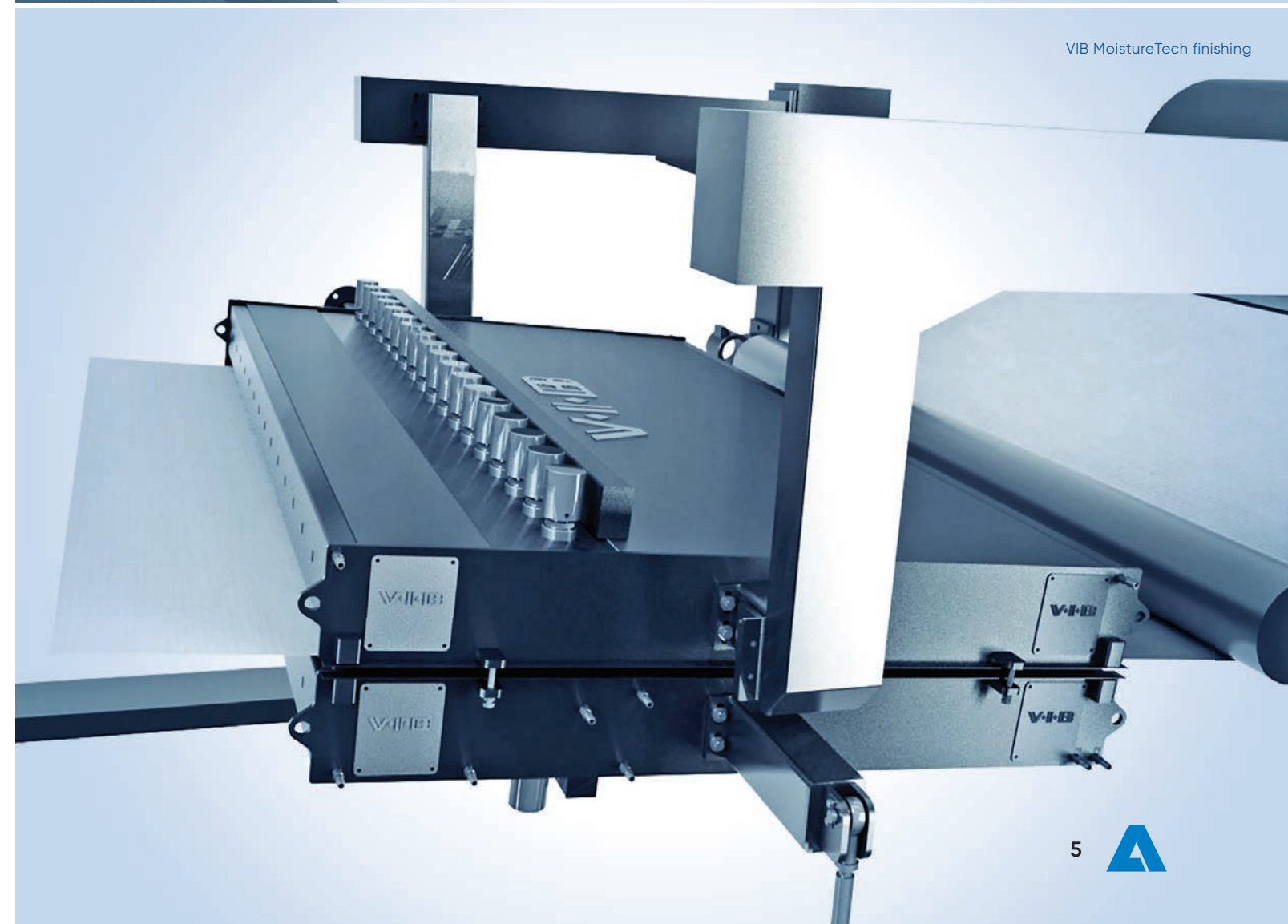
- Top and bottom side applications
- Dwell time zone for maximum moisture increase
- Drip-free design and vacuum channels for drip-free environment

VIB GLOSSTECH

- Minimized footprint for installation immediately in front of the nip
- Moisture gradient calendering for improved grade development
- Drip-free design and integrated vapor exhaust ensure high-quality performance

VIB CURLTECH

- Single-sided profiler for precise steam application, resulting in repeatable CD/MD curl control
- Flatter moisture profiles, better edge control, and consistent lay-flat sheets



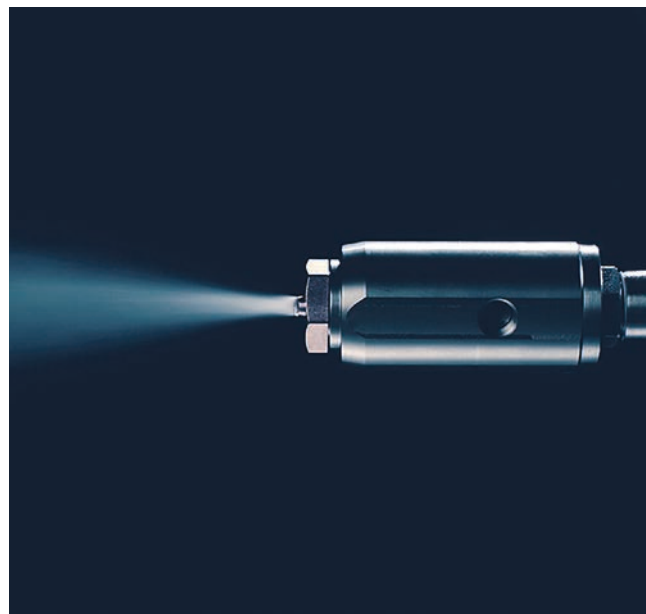
VIB MoistureTech finishing

Continuing innovation

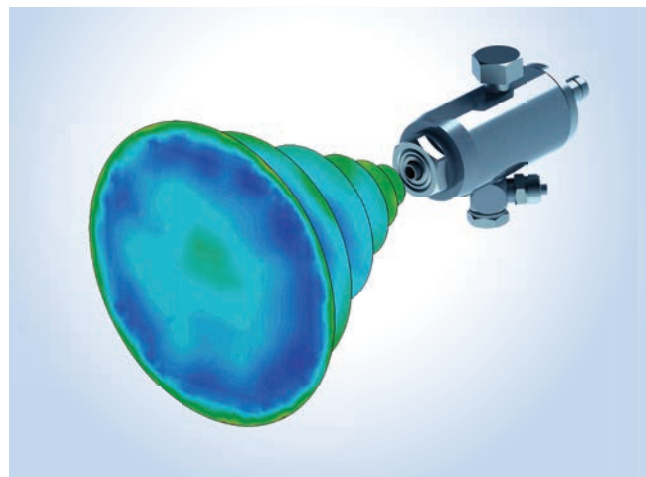
ANDRITZ continues to invest in the people, processes, and partnerships that are needed to drive continuous innovation.

This innovation delivers the value demanded by our customers and allows them to achieve a competitive advantage. However, our commitment to innovation does not stop there. Embracing the concept of emergent innovation, ANDRITZ understands that a

longer-term strategic vision is required to bring the type of breakthroughs, disruptive technology, and radical ideas required to fundamentally change the dynamics of the industry.



VIB spray nozzle



VIB spray nozzle fluid dynamics simulation

FUNDAMENTAL RESEARCH

Connecting the fundamental research and development to the engineering expertise of ANDRITZ is the driving force behind our innovative ideas and their successful implementation in the market.

- Continued investment in the latest modeling software for advanced fluid dynamics simulations that feed directly into the next generation of our nozzle and valve designs.
- As a hardware provider, we are unique in the amount of time and resources we invest in understanding the fundamentals of fluid application and interaction once on the paper/board.
- Development of on-site test units along with laboratory devices allows the execution of almost all conceivable experimental conditions that simulate customers' current or future needs.

STRATEGIC PARTNERSHIPS

- Joint research projects with universities on a global level to stay abreast of current trends in academic and fundamental research relating to our industry.
- Cooperation with industrial partners ensures that a holistic view of the entire system is considered from many perspectives, elevating the level of expertise applied to address customer projects.

Service

ANDRITZ recognizes the importance of ensuring that your investment provides guaranteed benefits throughout the products' expected lifecycle and beyond.

Our global team of experts provides all services from routine visits and complete system audits to complete rebuilds and retrofits. With manufacturing and service facilities in North America and Europe, short turnaround

times and by utilizing the latest technology, these rebuilds continue to be a cost-effective means of extending the benefits of the initial investment.

STANDARD SERVICE VISITS

- Thorough evaluation of system performance under operating conditions
- Assisting machine operators with troubleshooting efforts
- Detailed analysis of the mechanical condition of valves, actuators, nozzles, retraction systems, etc.
- Planning scope of maintenance and replacement schedule during upcoming outages

REPLACEMENT PARTS

- Guaranteeing 100 percent availability, ANDRITZ ensures the secure provision of replacement parts for all basic materials as well as key components
- Guaranteeing parts for all product generations, obsolete parts are replaced by new system components

REBUILD SERVICES AT VIB FACILITIES

- Cleaning and refurbishment of components as well as complete systems
- Complete rebuilds of ANDRITZ and third-party steam and spray systems
 - Lengthening/shortening existing booms for use on different machines
 - Upgrading all critical components to the latest technology
 - Cost-effective means of extending the lifetime of the original equipment



Water spray trial unit

OPTIMIZATION PROGRAM AND TRIAL SERVICES

- VIB SteamTech and VIB SprayTech trial units are available for on-machine evaluation, allowing you to assess the technology and gather data under true process conditions.
- Our experts will provide recommendations on profile optimization strategies, engineering and installation options, efficiency improvements and opportunities for energy savings.



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