



PULP & PAPER

# FIBER GPS™

YOUR TRUSTWORTHY FIBER QUALITY NAVIGATOR





## Reach your destination without detours

One of the most convenient and relaxing features of a car GPS is its ability to provide you with the exact arrival time in advance. Additionally, it helps you determine the shortest or most efficient route to your destination. Throughout your journey, the GPS system recognizes and supports any changes you make, ensuring you reach your desired location safely and in the least amount of time and fuel consumption.

Similarly, experienced stock preparation process area operators possess the skills to operate equipment and achieve the desired pulp quality. However, it's worth considering whether they always take the shortest and most efficient route. Wouldn't it be beneficial for every stock preparation operator to have the ability to predict changes in fiber quality before making adjustments to the refiners? This foresight would greatly enhance their decision-making process and improve overall efficiency.







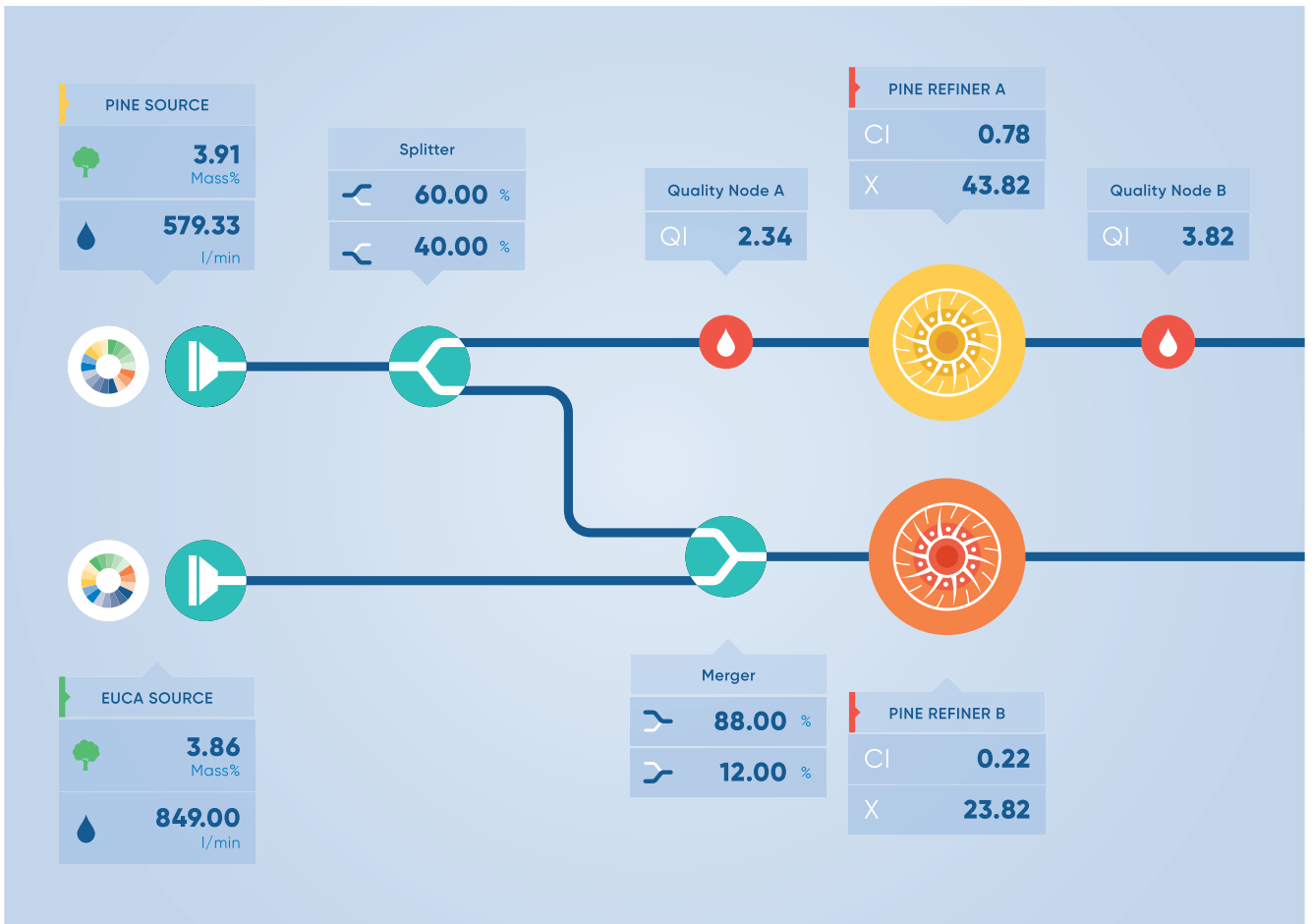
Over the course of more than a decade, our dedicated research and development efforts have been aimed at comprehending and describing the inner workings of a Low Consistency Refiner. The outcome of this extensive undertaking is our proprietary simulation tool, Magnus™.

Magnus™ provides a reliable estimation of the refining process in each refiner. However, it does not predict the resulting fiber quality. Therefore, despite the significant progress made, we have continued to rely on expert experience and trial runs to achieve desired outcomes.

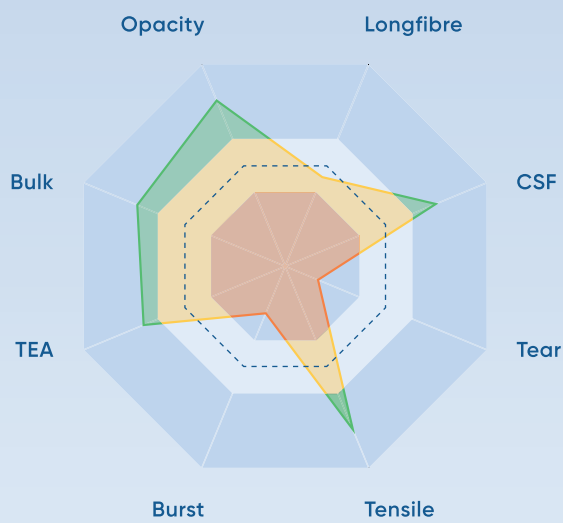
To further advance our development process, we have taken a significant step forward by merging Magnus™ with fiber quality response curves obtained from laboratory pulp sheet quality tests. This integration

has given rise to an exceptionally powerful simulation tool called FIBER GPS™. Unlike our previous focus solely on the refiner itself, encompassing plate lifetime and energy consumption, FIBER GPS™ enables us to delve deeply into the process of tailoring the fiber quality of the complete stock preparation system.

Through this holistic approach, we can now visualize the impact of factors such as fiber mix, process flow, plate design, and power application. The sophistication of our algorithms empowers us to predict fiber quality reliably throughout multiple refining stages and even when combining different refining lines. This breakthrough represents a significant advancement in the field.



## Quality Node B





# Simulation & Optimization Assisted Operation

Through the integration of refining action simulation and its impact on fiber quality development, Fiber GPS™ functions as a Digital Twin. We have devoted significant efforts to expand the system's capabilities and include optimization features to ensure customers derive maximum benefit from its usage.

Unlike data-only models, Fiber GPS™ relies on science-based algorithms that encompass digitized know-how, providing broader applicability and a deeper understanding of the refining process. It supports various use cases, ranging from assessing the current quality convergence of the process to running What-If scenarios and evaluating alternative system configurations.

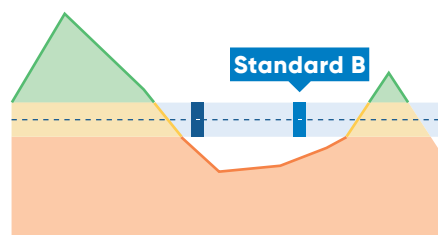
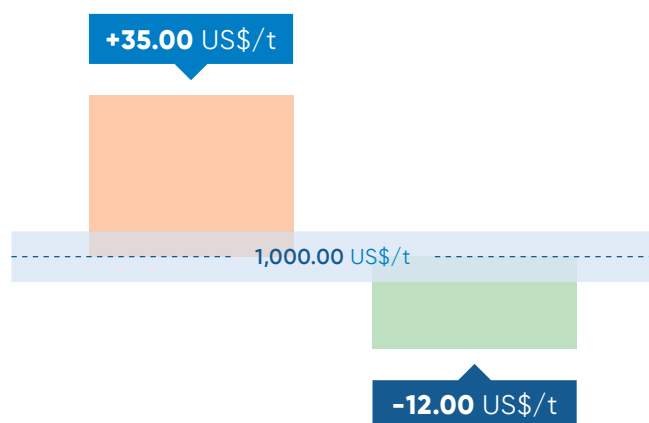
The inclusion of Fiber GPS™ within ANDRITZ's simulation platform, Metris IDEAS™, has enabled the deployment of an "optimizer" on top of the simulator, resulting in a powerful functionality upgrade. This combination of simulator and optimizer brings crucial information to the forefront, empowering operators or even more advanced systems like an Advanced Process Control (APC) to effectively close the loop and make informed decisions.

Ultimately, Fiber GPS™ integrated with Metris IDEAS™ creates a powerful tool that bridges the gap between theory and practical application, delivering actionable insights where they matter most.

## QUALITY ASSURANCE

Prior to engaging in simulation and optimization-assisted operations, it is crucial to ensure that the real-world system exhibits high-grade reproducibility. ANDRITZ' Metris CPA application (control performance assessment) serves as the foundation for tuning and monitoring system loops. Through this process, the real-world system can achieve high repeatability, laying the groundwork for successful quality assurance.

Building upon this foundation, Fiber GPS™ offers the capability to define acceptable fiber quality windows, encompassing both upper and lower limits, for the production of paper that meets specified quality standards. These quality limits can be made visible to the operator, allowing them to monitor and maintain control over the process. Additionally, Fiber GPS™ can also enable an APC system to take action based on these defined limits, actively ensuring that quality standards are consistently met throughout production.

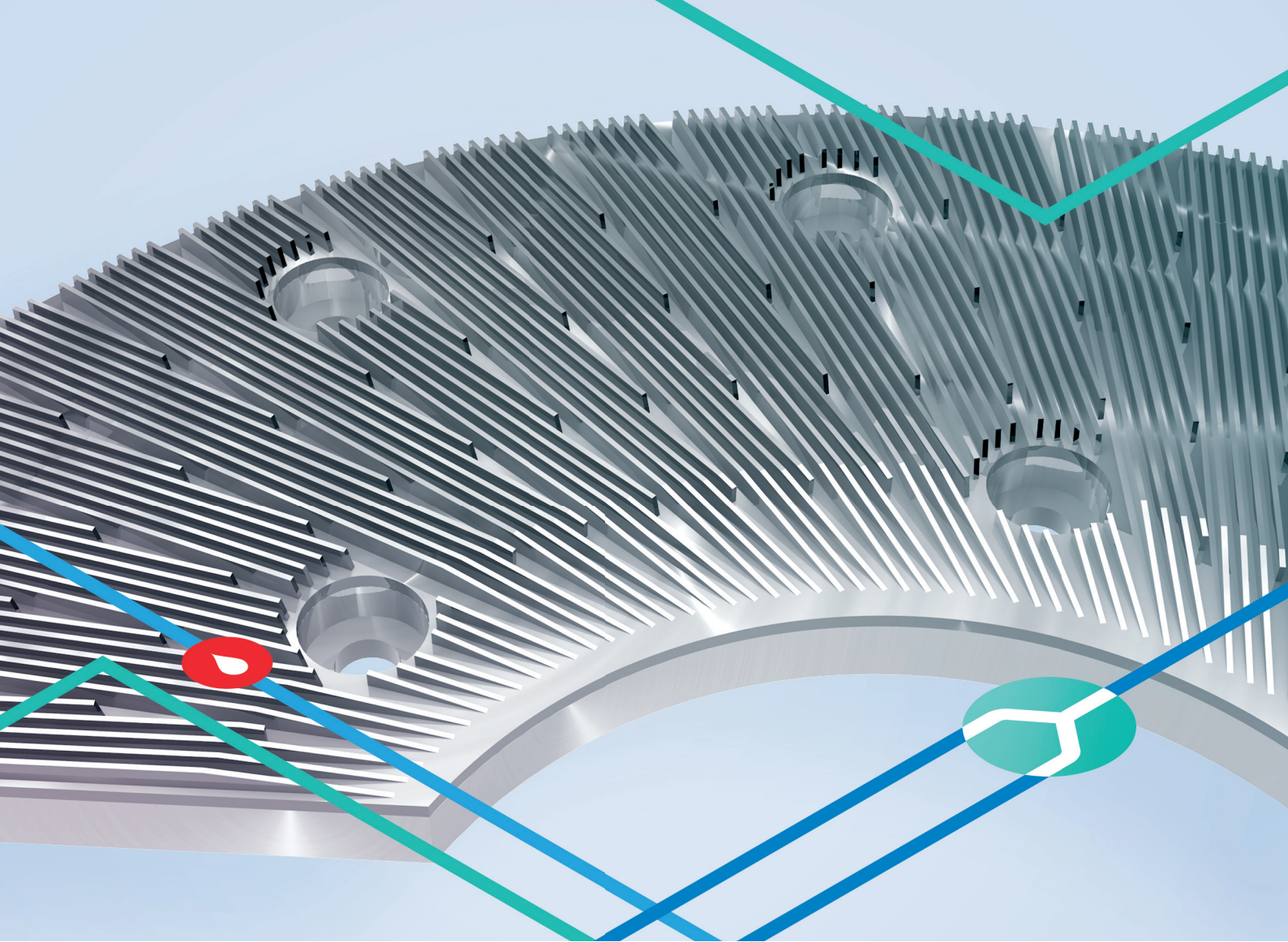


## FIBER MIX OPTIMIZATION / TCO REDUCTION / VENDOR QUALIFICATION

The inclusion of Scenario Management in Fiber GPS™ opens up opportunities to explore the impact of intentional changes in fiber mix. Users can assess how refining would need to be adjusted to achieve quality within specifications and whether refining energy can be saved while maintaining the desired quality. Furthermore, it becomes possible to estimate potential cost savings associated with altering the fiber mix.

Once the system has demonstrated its reliability, the burden on technical staff is reduced through the optimizer's capabilities. Scenario management becomes unnecessary as the optimizer automatically recommends the best Total Cost of Ownership (TCO) solution based on the mill's criteria. This relieves the staff of manual decision-making processes and streamlines the optimization of operations.

Additionally, Fiber GPS™ can be utilized for Vendor Qualification purposes. Once the quality of a specific supplier or fiber source has been understood through testing and modeling, the tool enables a quick assessment of its usability. The reliable simulation and optimization capabilities offered by Fiber GPS™ present limitless possibilities for enhancing operations, efficiency, and decision-making processes.



### **ANDRITZ PLATE PATTERN OPTIMIZATION**

ANDRITZ relies on the expertise of its Regional Product Managers (RPMs) to recommend plate patterns to customers. These recommendations are based on the RPMs' extensive experience and the collective knowledge and best practices of the global ANDRITZ RPM network. However, due to the complex nature of refining processes, trial runs and hands-on learning are often necessary.

Typically, the focus is limited to a specific refiner, which can restrict the overall understanding of the system. Nonetheless, customers who utilize FIBER GPS™ and have a PM stock preparation system with established

### **PAPER GRADE DEVELOPMENT**

While paper grades can remain stable over extended periods, changes in the market or grade policies within a group of paper machines may necessitate the development of new or enhanced standards.

To expedite the achievement of new paper quality targets, scenario management supported by the

standards can benefit from the assistance of ANDRITZ plate specialists. These specialists provide support in fine tuning ANDRITZ Refiner Plates to meet the specific requirements of each customer's system.

This fine-tuning process is facilitated through the use of offline scenario management. By analyzing the effect of each plate choice on the entire system, the plate specialists ensure the maximized effectiveness of the plate selection process. This comprehensive approach allows customers to achieve optimal plate patterns that are specifically tailored to their particular system requirements.

optimizer proves invaluable. By leveraging current pulps and refining systems, and incorporating experience or demand-driven requirement changes for paper grades such as increased strength or higher bulk, the process becomes more efficient, enabling faster achievement of the desired quality goals.

# Fiber GPS™

## Features Overview



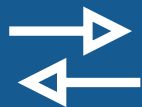
### VISUALIZE FIBER QUALITY

View all quality nodes as individual spider diagrams with all relevant parameters at a glance.



### SET UP QUALITY STANDARDS

Set up and manage quality standards for each paper grade to compare different scenarios.



### COMPARE TO STANDARD

Compare qualities of real time and simulation modes to standard qualities.



### ADJUST PROCESS VARIABLES

Adjust relevant process variables to simulate impact on fiber quality and TCO.



### BROWSE PLATE PATTERNS

Browse through ANDRITZ refiner plate library and simulate with different plate patterns.



### MANAGE SCENARIOS

Build your own process setups easily using the components library and manage complete scenarios.

ANDRITZ Inc.  
130 Buffalo Road; Suite #210  
Lewisburg, Pennsylvania  
17837, USA  
m: +1 (570) 329 6037  
[peter.antensteiner@andritz.com](mailto:peter.antensteiner@andritz.com)

**ANDRITZ**

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