# PulpOnTarget

## Calculate pulp properties and minimize quality deviations

ANDRITZ

# What drives us forward?

ANDRITZ's aim is to make the fully autonomous mill a reality because of the measurable outcomes it brings to our customers' industrial plants. These outcomes impact four strategic pillars that directly influence operational performance: process, asset, human, and sustainability.

**PROCESS**

**ASSET**

**HUMAN**

**SUSTAINABILITY**

These pillars make our value tangible, connecting solutions to what truly matters to our clients: real, measurable results.

# How can we make a difference in your mill?

This is the question that guides the development of every ANDRITZ automation and digitalization solution for the pulp and paper industries. More than delivering technology, our commitment is to generate real and measurable impact on our customers' operations. We believe that true value lies in results you can measure. That's why we focus on outcomes that are tangible, trackable, and aligned with our customers' goals. In practice, this means connecting solutions that can act on:


These are real gains, connected to each pillar, transforming technology into tangible results. By connecting solutions designed to solve specific industry challenges, we deliver new ways to make a difference and contribute to results. This is how we transform technology into real value.

# How the technology behind PulpOnTarget works

The PulpOnTarget combines data from PulpEye Fiber Properties online measurements with the ExtractEye software to calculate pulp properties.

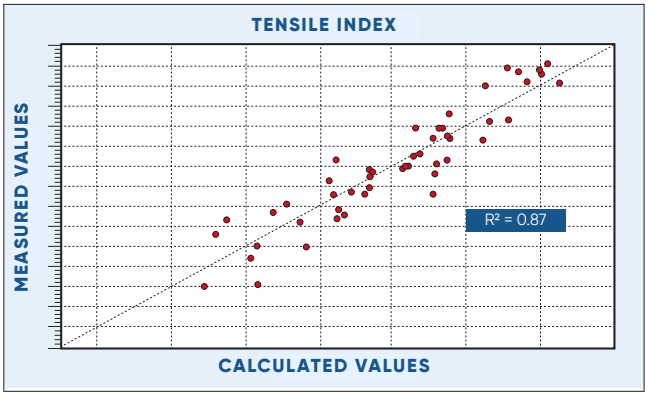
The customer provides samples of reliable laboratory data. This is compared in advanced statistics, ExtractEye solution, with selected PulpEye data collected during corresponding times, and variations in pulp quality data are modelled variations in fiber and other properties. The PulpOnTarget model can then be use in real time to calculate the pulp quality data of the end product long before the laboratory results are available. In this way production managers, quality managers and process operators can easily see the current quality levels and their variations in real time.

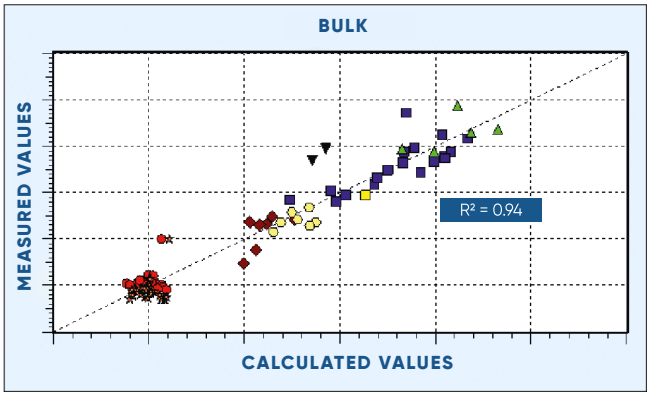
**CURRENT QUALITY LEVELS IN REAL TIME**

**LAB DATA:**
- Bulk
- Tensile index
- Tear index
- Z-strength
- Porosity
- Scott Bond

**CALCULATIONS:**
- Bulk (PulpEye variables)
- Tensile (PulpEye variables)
- Tear (PulpEye variables)
- Z-strength (PulpEye variables)
- Porosity (PulpEye variables)
- Scott Bond (PulpEye variables)

**PulpEye 380+ VARIABLES:**
- Lengths
- Widths
- Curl
- Fines
- Shives
- Crill
- Freeness




Two examples show the correlations between laboratory tests and calculated values of tensile index and bulk. The $R^2$ value signifies how well a model predicts a paper making properties of pulps (like strength, brightness) from input variables (pulp type, refining, etc.), with $R^2$ closer to 1 indicating a strong fit.

## THE PulpOnTarget PACKAGE

Records changes in variables such as raw material and process parameters in real time.

## BENEFITS WITH PulpOnTarget INCLUDE:

- Analysis data of pulp properties are obtained every 5-15 minutes, making it quick and easy to determine if the pulp is on target
- Calculated quality data like bulk, strength properties, and porosity in real time
- The process can be run closer to the specifications
- Alarm when the process goes off target
- Less energy consumption in production
- Calculated data can be supplied to pulp customers, providing them with useful information
- No need to wait for laboratory data
- Less time required for laboratory tests

## AVAILABLE IN TWO OPTIONS:

- The clients buys the whole package including ExtractEye software installed on-site and connected to the mill's PulpEye Fiber Properties Analyzer, this allows the customer to actively use and run PulpOnTarget
- PulpEye Analyzer Consulting uses ExtractEye for remote follow-up and to calculate the pulp quality and properties, and delivers reports as well as updates to the model

## PulpEye ANALYZER MODULES

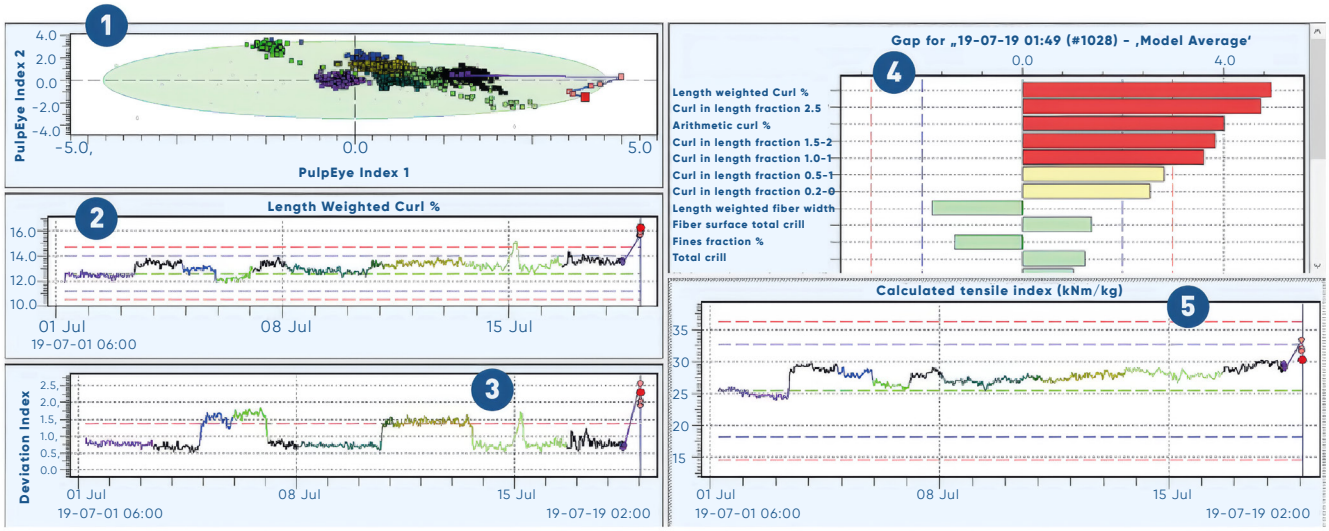
The PulpEye Analyzer modules produce a large amount of analysis data during each analysis cycle. For example, the fiber module, which is installed in every PulpEye Fiber Properties Analyzer unit, produces fiber data within 30 seconds, which is split into almost 400 variables. The challenge is to extract the most valuable information, which is exactly what PulpOnTarget does. Normally, only part of the analysis data is displayed, but with PulpOnTarget, the whole dataset is easily visualized.

## PulpOnTarget

PulpOnTarget is flexible, and the process operator can choose the most important quality properties to display. In order to explain how PulpOnTarget helps process operators to keep important end properties within specified limits, we have chosen the following case illustrated below. The different colors in the graphs represent different products produced during this period.

This case study shows what can happen when certain properties go out of spec and need to be corrected. In this case study, the quality was within specifications for all grades produced during the period starting July 1.

The process operator monitors the calculated tensile index (Graph 5) to ensure it remains within the specifications for each grade. However, on July 19 at 01:49, an anomaly occurred that caused the calculated tensile index to be outside specifications. Graph 4 was therefore selected and displayed to determine which parameters caused the problem. Out of all variables measured by PulpEye Fiber Properties Analyzer, the five most anomalous ones are shown at the top of parameters listed in red in Graph 4. Graph 2 shows the trend of the problematic parameter length weighted curl and confirms that it suddenly increased beyond specifications.




The different colors represent different products produced during this period.

### 1 PULP TYPE INDEX 2 VS PULP TYPE INDEX 1

The accumulated analysis result from each measurement is presented as a colored dot in the green ellipse, i.e. the operating window. In this example, the vast majority are within the target limits. However, something has happened in the process, as illustrated by the red dots.

### 2 LENGTH WEIGHTED CURL FOR DIFFERENT PULPS

In this case length weighted curl is one of the variables with the largest deviation, which is why the process operator has chosen to see the trend of this parameter.

### 3 DEVIATION INDEX FOR DIFFERENT PULPS

The deviation index for different products is represented by different colors. They are all within their respective specification except the anomaly on July 19.

### 4 DEVIATIONS OF VARIABLES COMPARED TO THE REFERENCE AVERAGE

At any given time, this graph shows the deviations of individual variables compared to the average reference data from the PulpEye Fiber Properties Analyzer. This is sorted so that the largest deviation is always shown at the top. The variables in red are the main causes for deviations from the target. In this case the curl in different fiber length fractions is causing the production deviation. The reason for the problem might be excessive energy used in the LC refining. One solution to the problem was to reduce the specific refining energy to allow fiber straightening to maintain pulp quality.

### 5 CALCULATED TENSILE INDEX FOR DIFFERENT PULPS

The graph shows that the calculated tensile index was within specifications, with the exception of this occasion, which was detected and shown by PulpOnTarget.

# Summary

PulpOnTarget is what it says, i.e. a reliable tool to help ensure pulp quality remains on target, and allowing pulp properties to be calculated during production without having to wait for laboratory results.

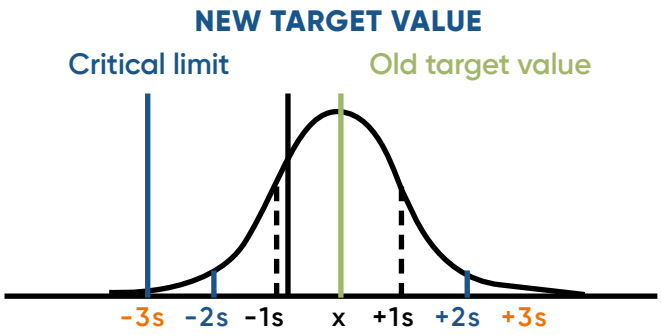
The same technology is used in the PulpOnTarget package, which forms part of the service packages from ANDRITZ. PulpOnTarget monitors the PulpEye modules to ensure that they are performing as they should and that their analysis data is reliable.

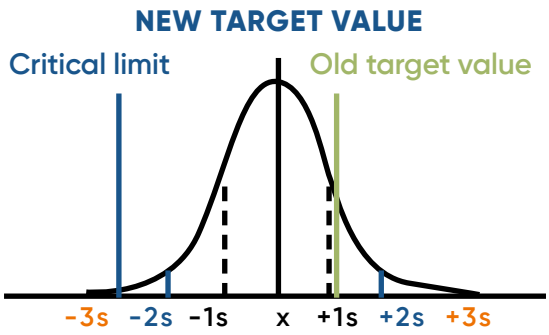
If deviations suddenly occur without any changes having been made to the process or raw materials, this may indicate that the analyzer module needs to be serviced, or process changes have occurred, or there is a lack of cleaning at sample points. Slower drifting data over time or sudden level shifts in data may indicate that servicing is needed. Regardless of the cause, PulpOnTarget provides an early warning to take necessary actions in order to minimize potential problems.

**BENEFITS OF PulpOnTarget INCLUDE:**

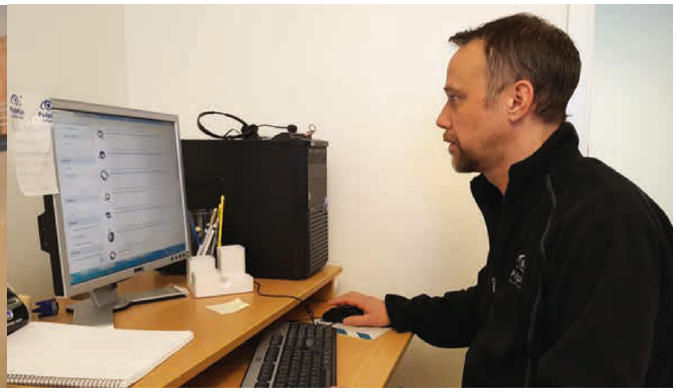
- Monitoring of all PulpEye analyzer modules
- Real-time module performance check
- Early warning of servicing requirements
- Check-up after service
- Easy to generate summary reports

**GET AN OVERVIEW**
PulpEye Fiber Properties Analyzer



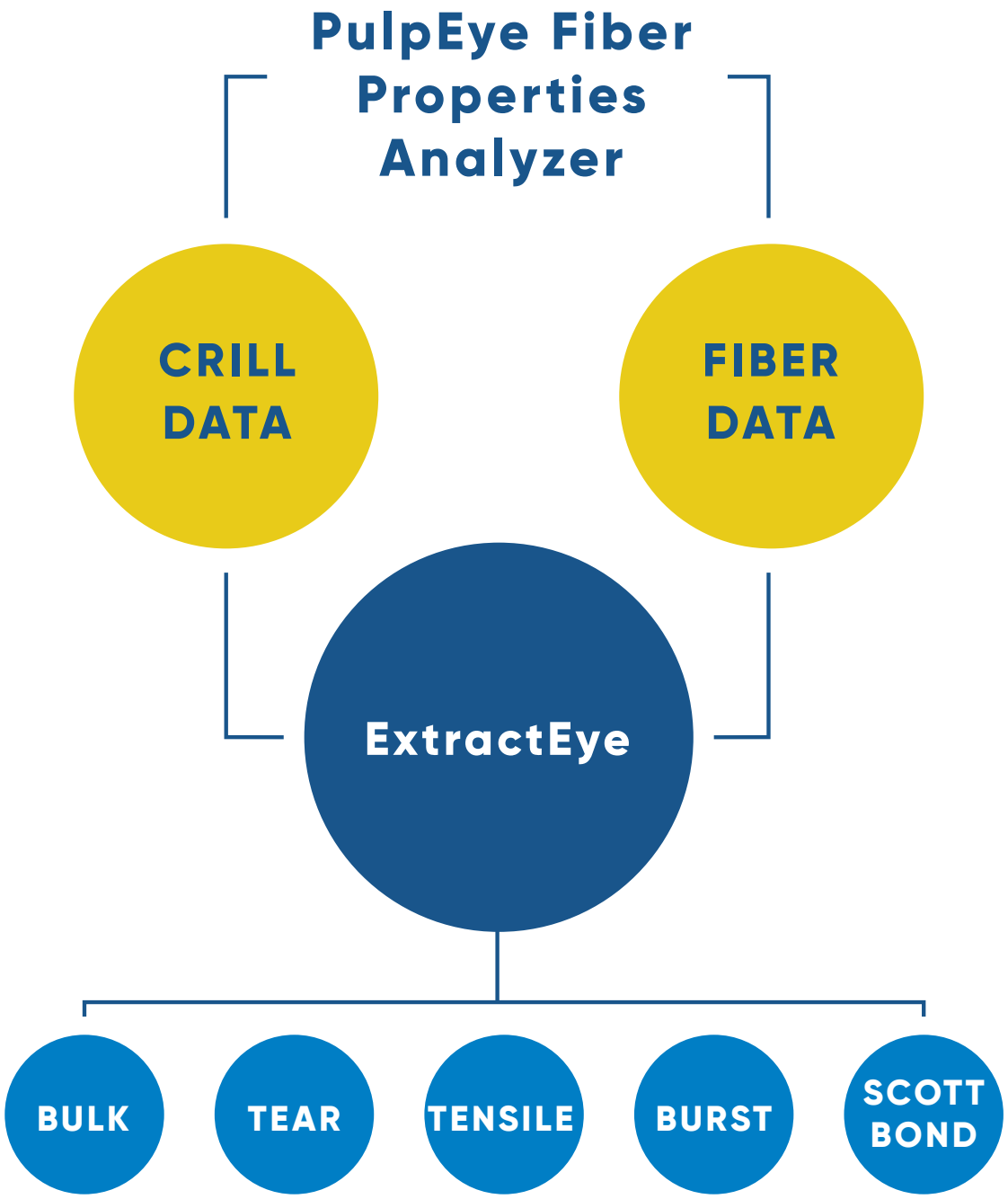




Typical client setup using Crill measurement in combination with fiber data.



Close cooperation between ANDRITZ and users ensures the right pulp quality is produced for the right end product.

**GET AN OVERVIEW**
PulpEye Fiber
Properties Analyzer




Typical customer setup using Crill measurement in combination with fiber data.

**GET AN OVERVIEW**
PulpEye Fiber Properties Analyzer

## CONTACT US FOR MORE INFORMATION

Advancing autonomous operations is our vision and is becoming an integral part of industrial processes. ANDRITZ is at the forefront of this transformation, leveraging digital innovations along with deep operational and technical expertise to improve process efficiency, quality management, and production reliability and availability.

We focus on developing autonomous pulp mills and process optimization, to support efficient and sustainable operations by combining automation, electrification, intelligent instrumentation, and digitalization to create measurable value throughout the full life cycle and the entire value stream.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