

PULP AND PAPER

ABB Web Imaging System

ABB Ability™ Quality Management System



- Three advancements in paper quality detection, analysis and management
- Reduces unscheduled downtime due to paper quality issues
- Drives higher profit potential
- Decreases rejects due to quality issues

For papermakers looking to optimize product quality, ABB Web Imaging System provides the most advanced sheet detection capability on the market. As an industry leader, ABB is constantly innovating ways to help customers improve performance, such as the newly developed features:

- Full Sheet Formation Analysis**
- Real-Time Wrinkle Count**
- Web Imaging Dirt Count**

You can't overlook the hidden costs of poor quality

The perennial challenge for pulp and paper mill management is identifying web defects and correcting them promptly—minimizing unscheduled downtime or margin losses. Relying on incomplete quality information and ineffectively managing web defects is too risky and costly.

Web defects produce a number of challenges:



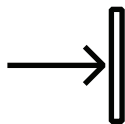
Roll set quality

How to determine roll-specific quality values to automatically classify rolls before they reach the winder.



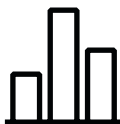
Root cause analysis

How to detect and connect quality issues back to their root cause so remedial action can be taken.



Unscheduled downtime

How to reduce or eliminate downtime caused by web breaks and defects.



Maintain margins

How to avoid losing value and decreasing profit potential due to quality issues and reprocessing.

The common denominator of these challenges is lack of early detection. Papermakers who effectively identify web defects and correct them promptly, before these defects impact performance and cause profit margin losses, gain a competitive edge over papermakers who don't.

The pioneer in full-width web imaging

ABB helped make full-width web imaging a reality more than 40 years ago. In fact, our historical brand-name offering, ULMA, soon became synonymous with web imaging. Today, pulp and paper mills continue to rely on ABB's Web Imaging System because of its unparalleled ability to reduce costs, improve product quality, increase productivity and enhance customer satisfaction.

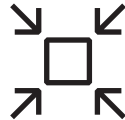
Our commitment to investing in research and development to create advanced and reliable technology is a key reason ABB has delivered imaging solutions to more paper machines than any other supplier.

The industry leader for a reason

ABB's Web Imaging System provides the most advanced sheet detection capability on the market. While others may attempt to offer similar features, they struggle to achieve our results. After all, ABB pioneered the online measurement approach and today continues to offer superior capabilities:



Industry's **fastest** and **smartest** fully integrated line-scan sensors



Industry's **smallest** hardware footprint



Seamlessly integrates with ABB's QCS / DCS systems to provide **deeper** intelligence



Industry's **brightest** LED source and full line of traditional halogen sources



Industry's **easiest** advanced classification tools



Total Web Monitoring System (WMS) Integration – **Faster** root cause analysis

Three new reasons to choose ABB's Web Imaging System

Innovations that add further value to your ABB Web Imaging System investment.

<p>Full Sheet Formation Analysis The only measurement solution that delivers conclusive measurement of paper uniformity for the full web</p>	<p>Real-Time Wrinkle Count The only system that detects and counts high volumes of wrinkles in real-time without interruption</p>	<p>Web Imaging Dirt Count The only system that accurately detects, counts and analyzes dirt in real-time across the full sheet</p>
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Full Sheet Formation Analysis

Features	Benefits
<ul style="list-style-type: none"> • Real-time, online formation analysis • Provides 100% sheet coverage • Analyzes and categorizes by 16 floc and void sizes • Formation Analysis can be combined with dirt count, defect imaging and advanced classification within the Web Imaging System • Delivers complete measurement of paper uniformity (alternative methods are non-conclusive because they don't measure everything) 	<ul style="list-style-type: none"> • Prevents misleading results • Reduces unscheduled downtime • Enables better and faster decisions by providing more complete information • Conducts deeper and more precise analysis of formation than competing systems • Decreases the amount of rejects or downgrades

Real-Time Wrinkle Count

Features	Benefits
<ul style="list-style-type: none"> • Real-time, online wrinkle count • Captures up to 1,400,000 wrinkle defects/s per camera • Automated classification based on user-defined data • Assigns weighted values to categories and alerts when KPIs are outside thresholds • Counts and classifies detected areas to five size categories • Intuitive user interface • Aligns defect maps to sample MD/CD location 	<ul style="list-style-type: none"> • Helps remediate issues with moisture retention • Reveals impact of inefficient headboxes on product quality • Handles high volumes of data without overloading the system • Enables excellent laboratory correlation • Improves process management • Reduces the amount of rejects

01 An example of high dirt density in pulp. In the left image, 60 defects are segmented and the corresponding measured areas in pixels are presented.

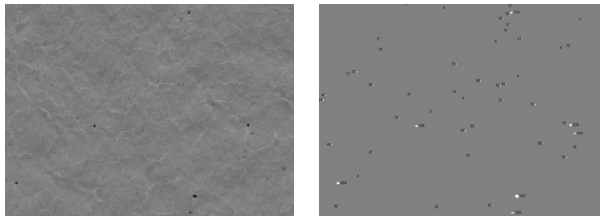
Web Imaging Dirt Count

Features

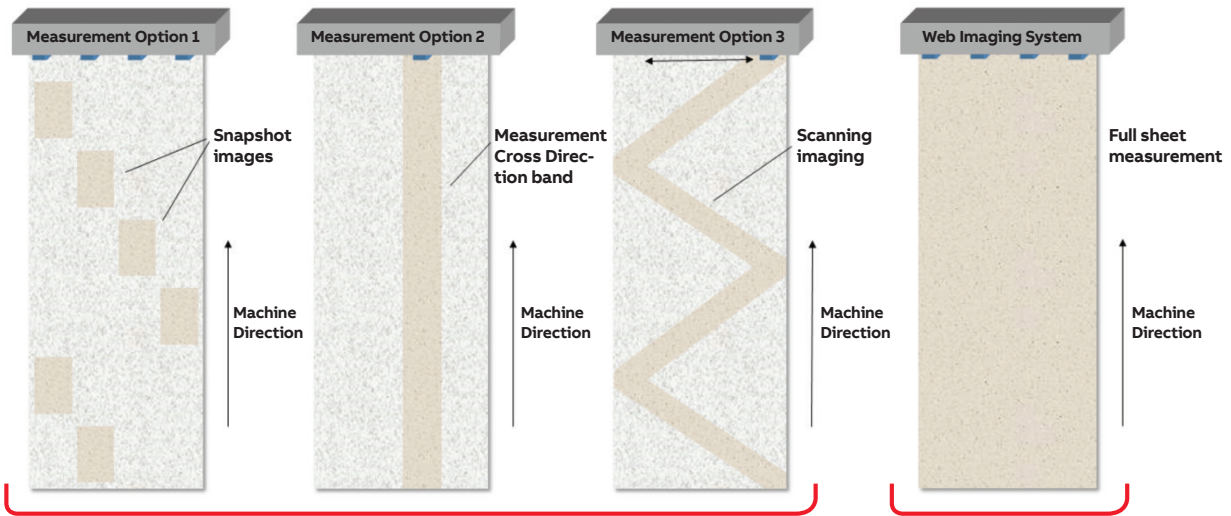
- Real-time, online dirt detection
- Provides 100% sheet coverage
- Captures up to 1,400,000 dirt defects/s per camera
- Intuitive user interface
- Links to Automatic Braking System, so rolls can be earmarked and created where there are higher dirt counts
- Aligns defect maps to sample MD/CD location

Benefits

- More accurate than manual detection and measurement
- Handles high volumes of data without overloading the system
- Enables faster corrective action
- Improves process management
- Increases production and quality
- Drives higher profitability
- Provides highly consistent results, which conform to industry standard dirt particle size categories



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Other inspection systems offer incomplete coverage and information

ABB Web Imaging System

ABB Web Imaging System measures and analyzes product properties and abnormalities during manufacturing.

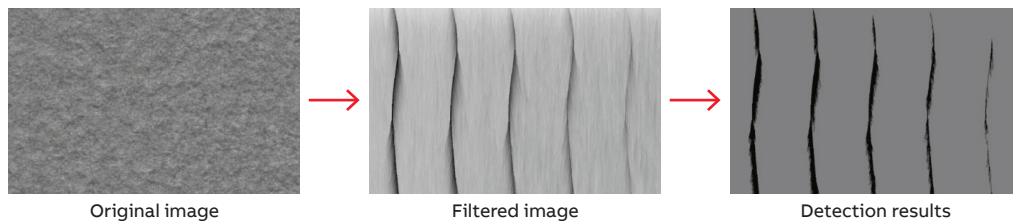
Additional features of ABB Web Imaging System

Effectively measuring in real-time to avoid downtime

— 02 The ABB patented WIS SDI (Subtle Defect Imaging) method is targeted at the detection of wrinkles, streaks or other subtle defects like weak spots.

ABB Web Imaging System is unique as it's the only solution on the market that continuously inspects one hundred percent of the moving web to immediately identify quality issues—in real time. It measures and analyzes product properties and abnormalities during manufacturing. The result? You effectively measure in real-time to avoid downtime. And stay ahead of your competitors.

Features	ABB solution
Imaging technology	Line scan cameras for higher resolution, continuous imaging, stable low-angle measurements, and smaller HW footprint.
Advanced signal processing and detection algorithms	ABB patented embedded low-contrast defect detection algorithms (SDI) and streak measurement to ensure even the smallest defects are found reliably (figure 2).
Automatic gain control and pixel shading correction	Continuous gain correction for optimal signal level and defect detection sensitivity from edge-to-edge. Factory adjusted sensor pixel correction.
Quality and adaptability of the illumination	Intense and efficient white LED illumination with fully adaptable light level for optimal illumination. Enables perfect illumination with unique dual row configuration.
Correct imaging geometry and configuration	Camera and light angles optimized for each application. Dynamic sample testing ensures the expected results.
Smart classification	Leveraging the latest advancements in algorithm design, ABB Smart Classifier places defects into meaningful groups with unparalleled accuracy.
Automatic Braking System	Optimizes cutting plan for maximum quality and profit potential.
Automation integration	Delivers actionable information to ABB's QCS and DCS systems, based on industry-leading ABB Ability™ System 800xA, enabling process alarms and quicker corrective actions to quality issues.
Deep configuration consultation expertise	ABB's proven insight ensures you select the right configuration for your mill.





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