

Quality Management for the Pulp and Paper Industry

Industrial IT Tools for Quality Data Management



Improving Customer Satisfaction through

Managing quality throughout the process

The Quality Management System is ABB's unique Industrial IT solution for the pulp and paper industry for data management throughout the mill complex, from the powerhouse through the pulping and papermaking processes, all the way to the scale line. It monitors and reports production quality for operations managers, sales personnel, and customers, reduces losses due to quality problems, and increases customer satisfaction.

ABB's Quality Management System may also be an essential part of the mill's eBusiness strategy. Connections to, and collaboration with, all elements of the supply chain ensure that quality standards are met from the supplier through to the customer.

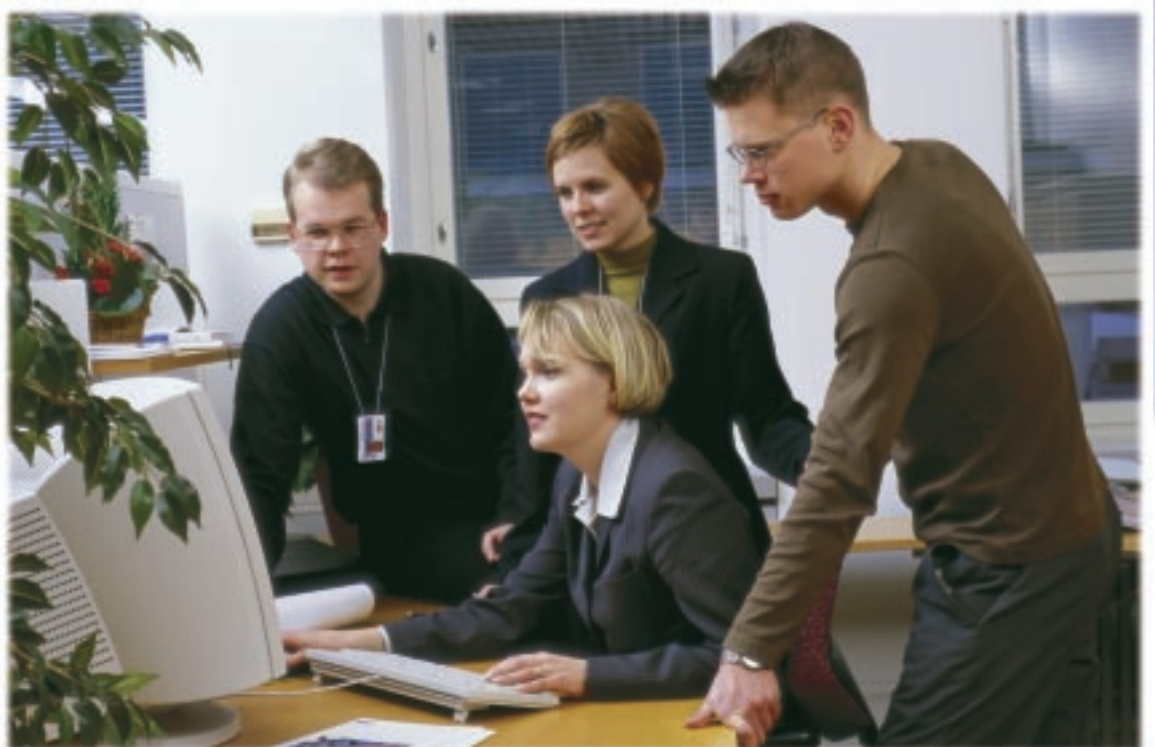
System functions tailored to the user's needs

The Quality Management System is built on a database of quality-related data and is designed to present the data to the right people in the right format. It delivers this functionality with flexibility yet consistency - as a configurable

product in compliance with industry standards for interoperability and open data exchange.

The system functions include

- Data Acquisition - gathering data from various sources, serving data to other applications
- Process Monitoring - reviewing real time process information
- Operator Displays - reviewing reel quality, identifying production upsets
- Roll Set Analysis - previewing customer roll quality
- Customer Quality Reporting - generating quality certificates and customer specific statistics
- On-line Queries - investigating complaints and reasons
- Data Analysis - analyzing historical data
- Statistical Quality Control - identifying process changes, establishing control limits
- Test Plans and Lab Device Calibration - managing laboratory work
- Clothing Processing - tracking equipment performance
- Raw Material Processing - testing and tracking raw materials



Quality Data Management

Valuable Benefits

The Quality Management System provides cost savings and improves customer satisfaction by

- Assuring the quality required by the customer
 - real time data analysis
- Minimizing customer complaints - customer specific quality requirements
- Providing complete traceability - direct and prompt answers to customer complaints
- Facilitating information handling - borderless access to data from different mill systems
- Improving productivity and product quality
 - developing existing quality processes
- Supporting comprehensive analysis of historical data - maximum flexibility and speed of data retrieval
- Supporting lab management functions - the right tests at the right times
- Integrating easily - interfaces possible to any system in the mill
- Supporting eBusiness - easy and quick follow-up of the supply chain

The Quality Management System enables mill personnel to plan, coordinate, and control production quality, from raw materials to delivered product, and to gather and analyze data captured at every step of the process. The result is reduced costs through better quality

determination, faster grade changes, reduced waste, higher revenues and strengthened trading partnerships from increased customer satisfaction.

The Quality Management System is a reliable, standard and open system. It is easily configured and each user or user group can have its own displays, entry forms and reports. The users themselves may also modify the displays according to their specific needs through an extensive use of templates.

The Quality Management System is easy to learn and use. ABB offers training for the maintenance personnel and supervisors providing them with the skills to use, maintain and configure the system.

Laboratory Management

The Quality Management System supports multiple lab devices, as well as product and machine-specific test suites. The test results and remarks can be entered for a reel, set, roll, or sample time. For mills without automatic paper testing systems, the system offers lab management functions that improve the efficiency and accuracy of manual operations.

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<script language=
<!--
function mOver(src
months1 = Januar
months2 = Februar
months3 = March
months4 = April
months5 = May
months6 = June
months7 = July
months8 = August
months9 = September
months10 = October
function mOut(src
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On-line Monitoring and Reporting

Proactive Quality Control

Real time monitoring and alerting allows the mill personnel to react swiftly to correct quality problems while the order is still on the line; capture of this data gives sales and customer service personnel the ability to electronically inspect finished product.

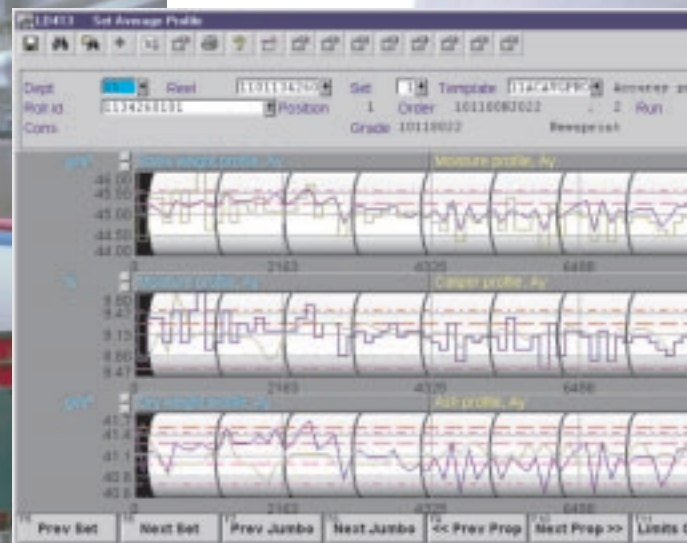
The most powerful system functions combine data from multiple sources. The Roll Set Analysis function evaluates reel quality against the planned trim. The system calculates the roll average and standard deviation for each property using on-line data from profile measurements and web inspection systems. Thus, roll averages and deviations are truly applied to individual rolls based on all applicable data.

The system alerts the operator if a roll does not meet product or customer specifications. If this happens the reel can be re-trimmed in order to maximize quality yield. By changing patterns and rerunning the analysis, mill personnel can evaluate "what-if" scenarios to determine the best trim given the quality of the reel.

Maintaining the Quality Database

Storage of quality information, combined with analysis tools allows personnel to survey production and processes to spotlight and correct problem areas. The Quality Management System stores quality data in a relational database for maximum flexibility and speed of retrieval. The queries can be made using different criteria. The system keeps data in its raw form, so that it can be summarized in any fashion at any time.

For ultimate performance the process data can be stored in a Real Time Database. This option offers unparalleled performance of data acquisition gathering up to tens of thousands of new values per second. The Real Time Database is a process data warehouse where information from various data sources such as process control systems, quality measurement devices and environmental control systems can be stored. It is seamlessly integrated with the Quality Management System allowing the mill personnel to analyze data from the whole mill complex, identify trends and see relationships. The mill decides

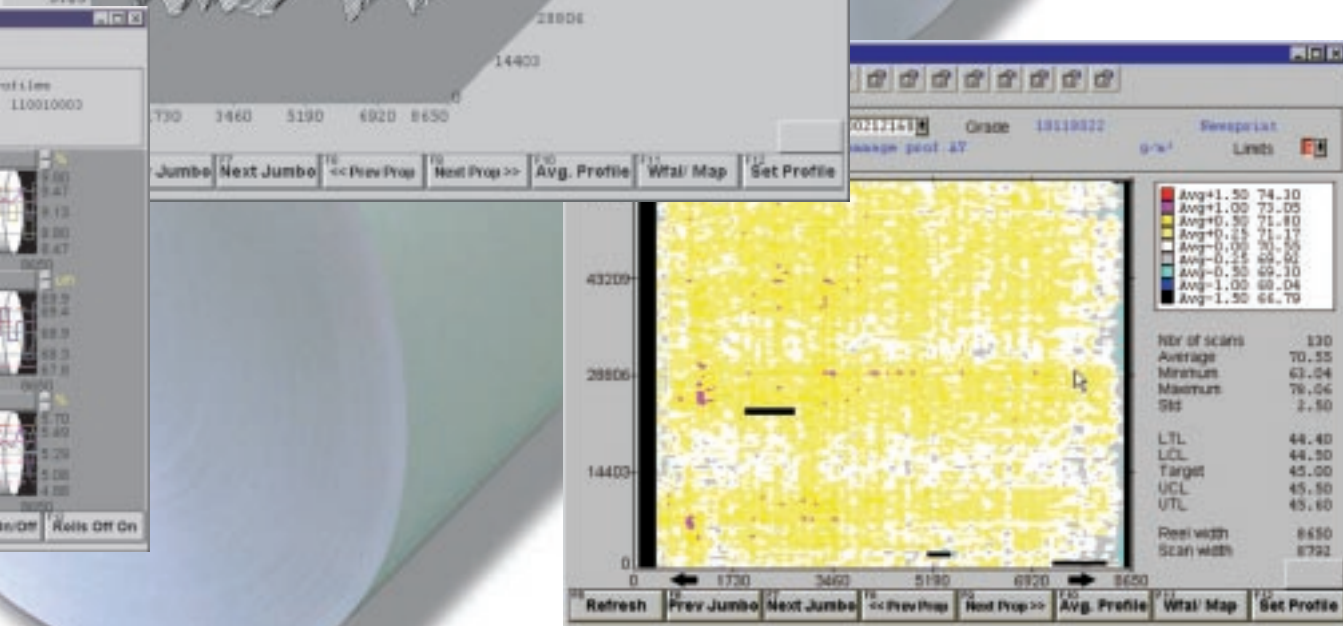
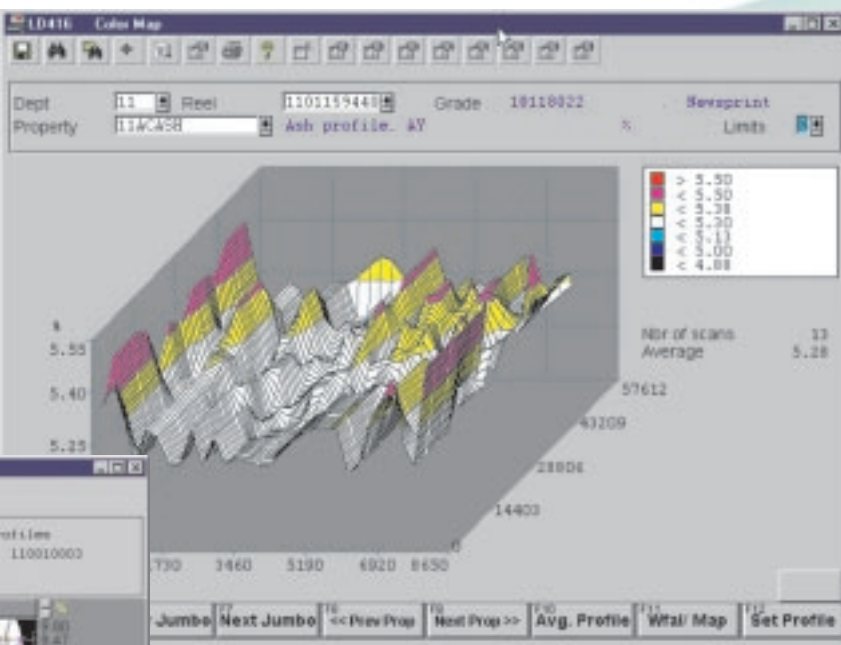


what data to keep and how long to keep it and the database is sized accordingly. There are no limits for the scalability and the size of the Real Time Database.

Reporting Quality Data

The Quality Management System provides the mill personnel with the information they need to respond promptly and directly to problems as they arise, and to report and analyze quality information for process and production improvement. The system includes a broad set of standard reports that can be printed on demand or to a predefined schedule. Managerial reports can be generated e.g. per shift, day, month or year.

The reel quality reports show the quality of reels produced in a particular run or during a specified timeframe. The Order Quality Certificate shows important quality measurements for each item in a customer order. The mill personnel decide what properties to include in the certificate and can specify different properties for different customers and products. The system does not simply supply run statistics, but accurate information about the product shipped to the end customer.



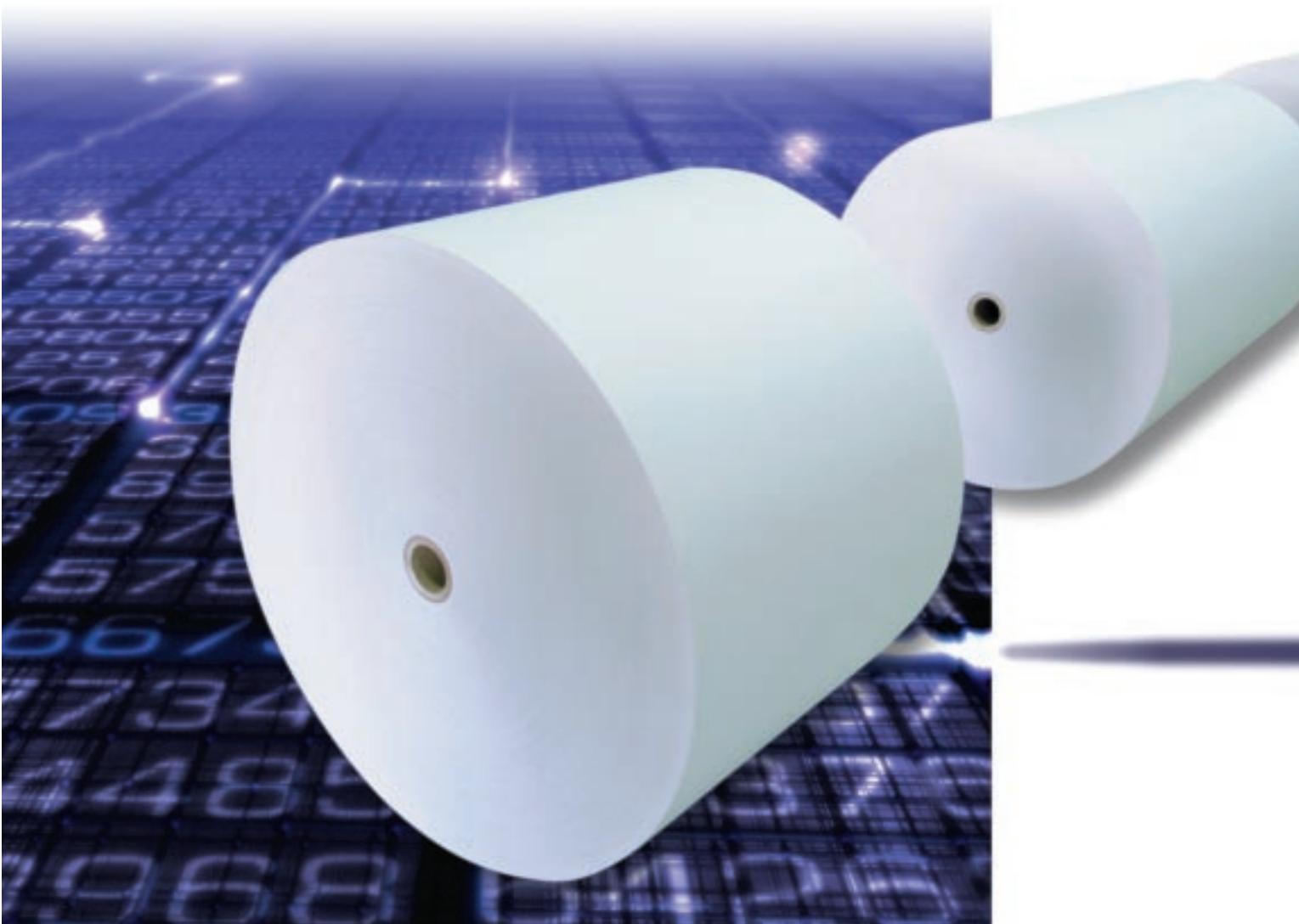
Optimizing Processes and Mill Operation

Data Analysis

The Quality Management System enables continuous process optimization, streamlining, and innovation. Historical process and production data from the whole mill complex can easily be retrieved for a specific grade, order, time or reel interval. The data can be modified, analysed and saved as a separate data set without changing the original data. The system generates trends, histograms and calculates the correlation for selected properties. The retrieved data can also be exported to another software for further analysis - standard configuration launches an Excel spreadsheet populated with the data.

Statistical Quality Control

The Quality Management System is an effective tool for improving existing quality processes. The Statistical Quality Control (SQC) function analyzes long-term process information and identifies changes in the process conditions. The data can be displayed e.g. as trends or range charts in which the points are shown against target values. On-line SQC monitoring can be performed automatically on selected variables. The history data can be used as reliable reference for establishing control and tolerance limits.



Seamlessly Integrated Solution

ABB Industrial IT solutions are based on the networking of knowledge, information, process automation and control applications. Applications based on different hardware and software solutions are integrated together, including the business systems.

For more than 30 years ABB has been helping the world's pulp and paper makers to improve mill operations with the Manufacturing Executions Systems. The Quality Management System is a member of the MES application family. It is a system based on standard software modules, facilitating a flexible solution that can grow with your needs.





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