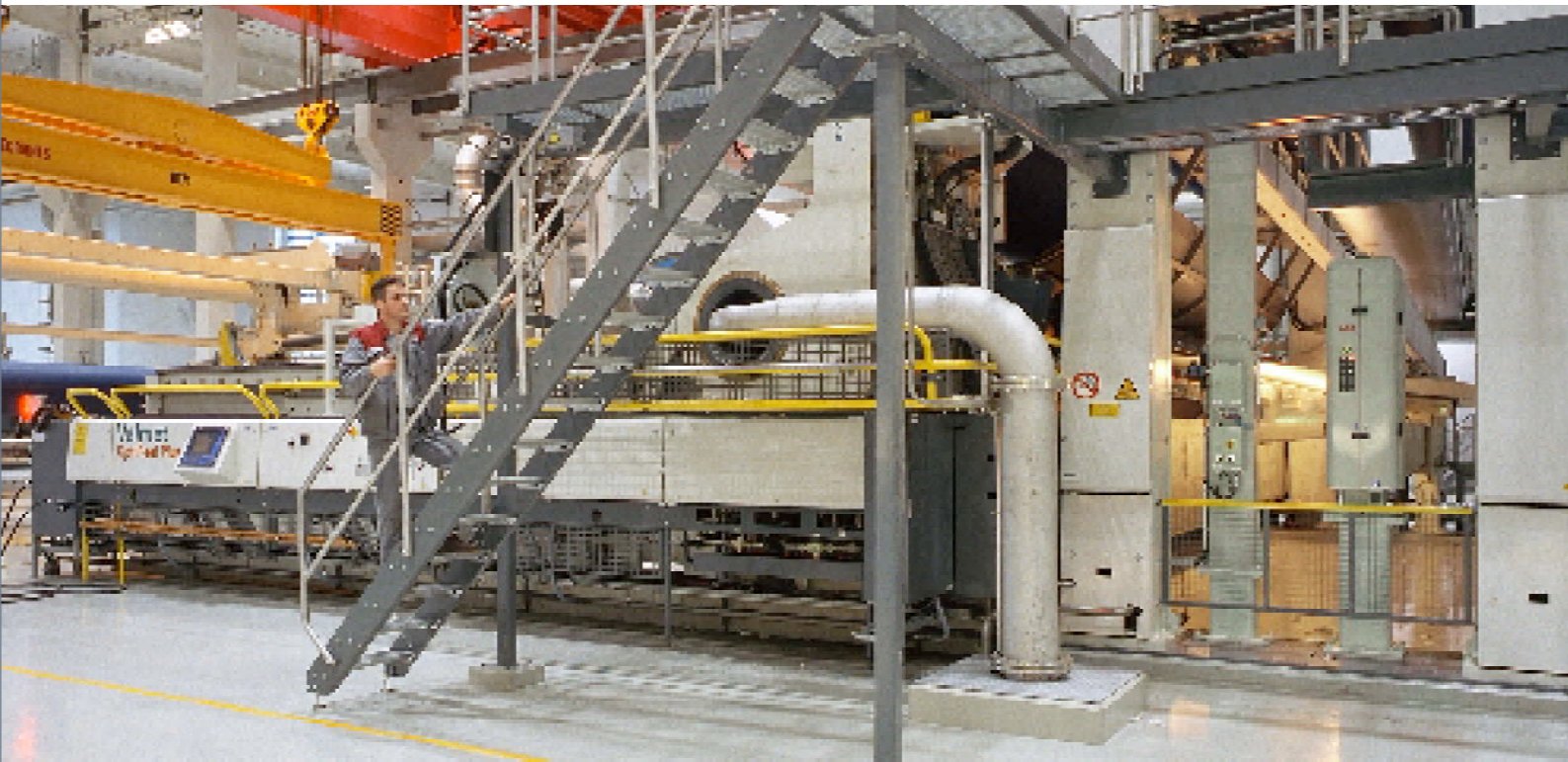


Industrial^{IT} Web Imaging Solution

Optimized quality management for paper production lines



Web inspection – an indispensable tool in papermaking



Papermakers the world over are increasingly turning to web imaging as a powerful means to improve the efficiency of their papermaking lines. And when selecting a supplier for their web imaging projects, they do well in choosing ABB.

Our newest Industrial^{IT} Web Imaging Solution, the ESI 7, offers you the latest state-of-the-art tools for the identification of web defects and for taking corrective actions early, e.g. before unscheduled downtime or receipt of customer claims.

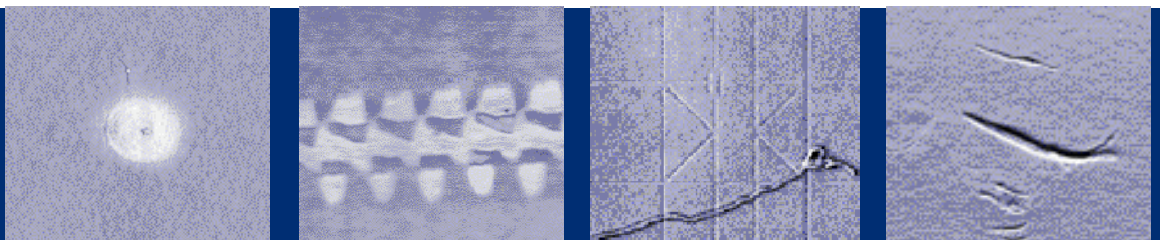
The ESI 7 combines our proven imaging technology with an innovative defect detection and classification system, providing 100% monitoring of your paper production for all paper grades, around the clock and without interruption.

Benefits across the line

The distinct advantage of our solution is that it not only allows you to certify the quality of your product, but also to fine tune your process and make corrective production and maintenance decisions before problems occur. Your benefits include:

- Non-stop 100% quality inspection
- Less rejects and customer claims
- improved productivity and process control
- early warning for preventative maintenance
- extensive reporting tools
- full integration with other systems

ESI 7's high-resolution images – also for hybrid flaws such as slime spots, starch spots and stock lumps.



Keeping it smart and simple

World leading defect detection and classification system

The heart of the ESI 7 is its advanced defect detection and classification system. The system's operator interface, which has been designed on the basis of customer feedback to be intuitive and easy to use, gives you immediate access to detailed information and images of any flaws in your process.

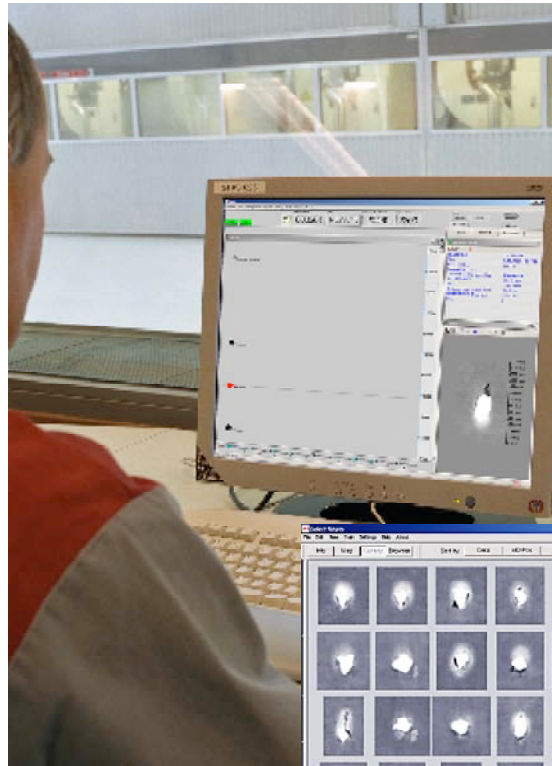
The study of these images, and comparison with similar images supplied by the system's growing history database, offers you a powerful tool to establish whether the problems are due to impurities in raw materials, problems in wet end chemistry or failures in machine parts.

Over the long-term your overall efficiency will improve as your history database grows and as you define defect classes more precisely according to your needs. In short, ESI 7 takes you to the level of detail you require – no more and no less.

Defects organized into meaningful clusters

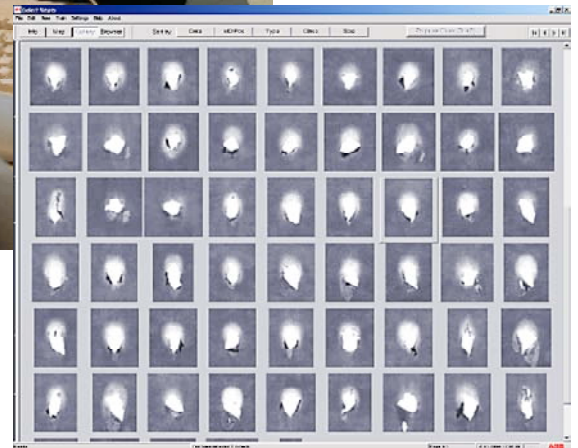
The ESI 7's new neural network-based classifier technology is a great improvement to the defect classification process. When searching through the defect database, you are no longer limited to conventional rule-based searches, but can also ask the classifier to organize defect images into meaningful clusters using the classifier's built in self-organizing map technology.

Working with these clusters on the operator display is easy and effortless, allowing you to adjust the parameters of your papermaking process with precision and efficiency.



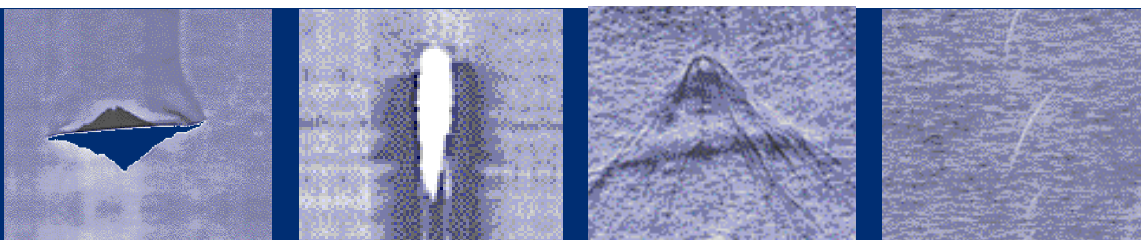
ESI 7's user-friendly interface:

- Easy to view individual images or image clusters
- Convenient access to classification information
- Simple and intuitive to use



Smart clustering:

- Automatically organizes defects into meaningful groups
- Becomes more accurate as your history database grows



Capture defect data to the level of detail you require – and then store for future reference.

Proven technology

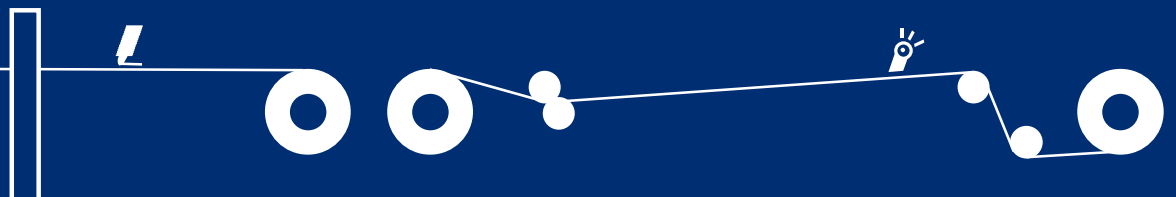


ABB's expertise in web inspection dates back more than 30 years. Indeed, we are the pioneer in web inspection and have delivered web inspection solutions to more paper machines than any other manufacturer.

It is this experience that has allowed us to continuously develop our web imaging technology for the better, down to the smallest detail. Though the uniqueness of the ESI 7 is its novel defect detection and classification system, it is also packed with a multitude of other advanced features that have been proven in thousands of installations worldwide. The ESI 7, for example, features the industry's smallest hardware footprint with no off-machine processing, the industry's only adaptive

illumination control, and the highest sensor MTBF. You will also benefit from the ESI 7's flexible SQL database reporting options, excellent defect marking solutions and its wide-range of automatic winding control options.

Experienced and proven: ABB is the pioneer in web inspection and has delivered imaging solutions to more paper machines than any other manufacturer.



Packed with industry leading features

Compact architecture

The ESI 7's system design has been reduced to the barest essentials. Your benefits include lower installation and maintenance costs, less space requirements and higher system reliability.

Smart digital cameras

The ESI 7 utilizes ABB's industry leading smart digital camera technology and dual-stage control. In addition to high resolution images with high capacity, the highly adaptable cameras offer a range of measurement geometries. Benefit also from fewer spares, calibration-free equipment, easy scalability.

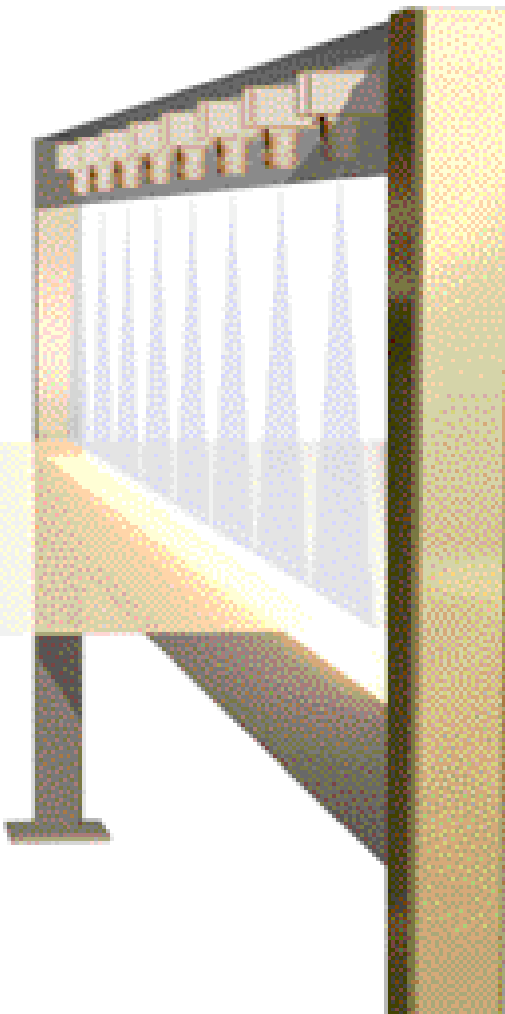
Automatic light intensity control

ESI 7's automatic light intensity control has been specifically designed for industry environments. This ensures accurate imaging over time – regardless of variables such as lamp aging, dust build up or opacity changes – and also less need for resetting parameters.

ESI 7 is packed with a range of industry leading technologies – from smart digital camera technology to comprehensive reporting tools.

Comprehensive reporting tools

ESI 7 comes with the full range of reporting tools to support you in your day-to-day operating decisions. Share data with other systems in real time or store in a SQL database for later use.



An integrated system



Life-long support

The ABB Web Imaging Solution comes with a full lifecycle management plan. This means that standard lifecycle services have been produced for various system generations, ensuring that you receive excellent quality and service throughout the lifetime of your equipment, as well as when making the shift to new technology at the end of the lifecycle.

Our comprehensive services range from training and installation through to preventative

maintenance and performance service – both on-site and remotely. These include:

- Installation & commissioning
- Training
- Technical support
- Spare parts & repairs
- Preventative maintenance services
- Migration & retrofits
- Performance service



Winning the endorsement of papermakers worldwide

Easy integration with other systems

The ESI 7 is Industrial^{IT} enabled. This means that the ESI 7 interoperates perfectly with other ABB products bearing the Industrial^{IT} symbol, and can be integrated into ABB's comprehensive Industrial^{IT} architecture in a "plug & produce" manner.

This integration includes the ABB Automatic Braking System, which offers you a powerful means to speed up the correction of web defects and maintain maximum re-reeler/winder efficiency – for improved overall productivity.

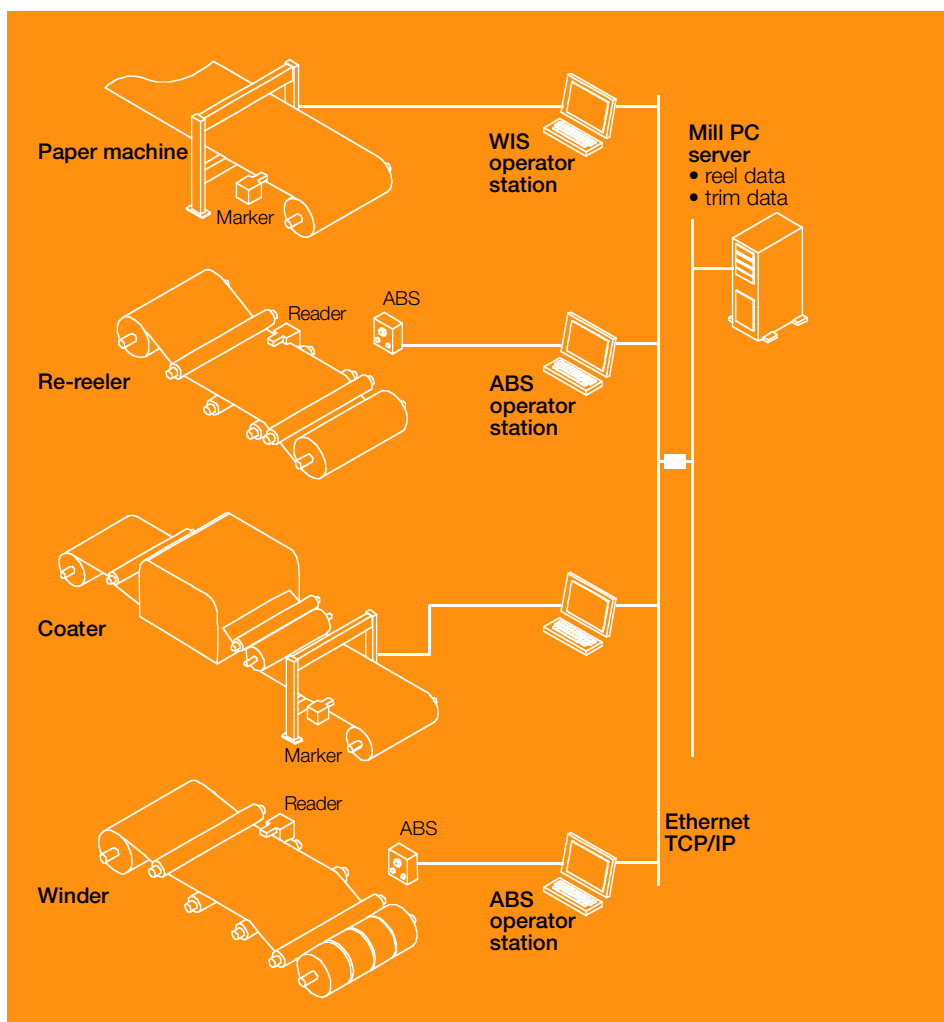
The information exchange between the ESI 7 and existing Quality Control Systems, Open Control Systems and Quality Management Systems is realized via TCP/IP, OPC or serial link.

Choose ESI 7 for a range of coated and uncoated applications, including:

- Newsprint
- Specialty
- Basestock
- Finewriting & printing
- Lightweight coated
- Premium coated
- Liquid packaging board
- Food board
- Tobacco

And also for non-paper grades such as:

- Metals
- Nonwovens
- Glass fiber mat



The best feature of the ESI 7 is its short payback time. Start estimating your savings using the formulas below:

- Break time x margin / h
- Off-spec quality x margin / ton
- Lost speed x time x margin / h
- Machine damage costs + lost production margins





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