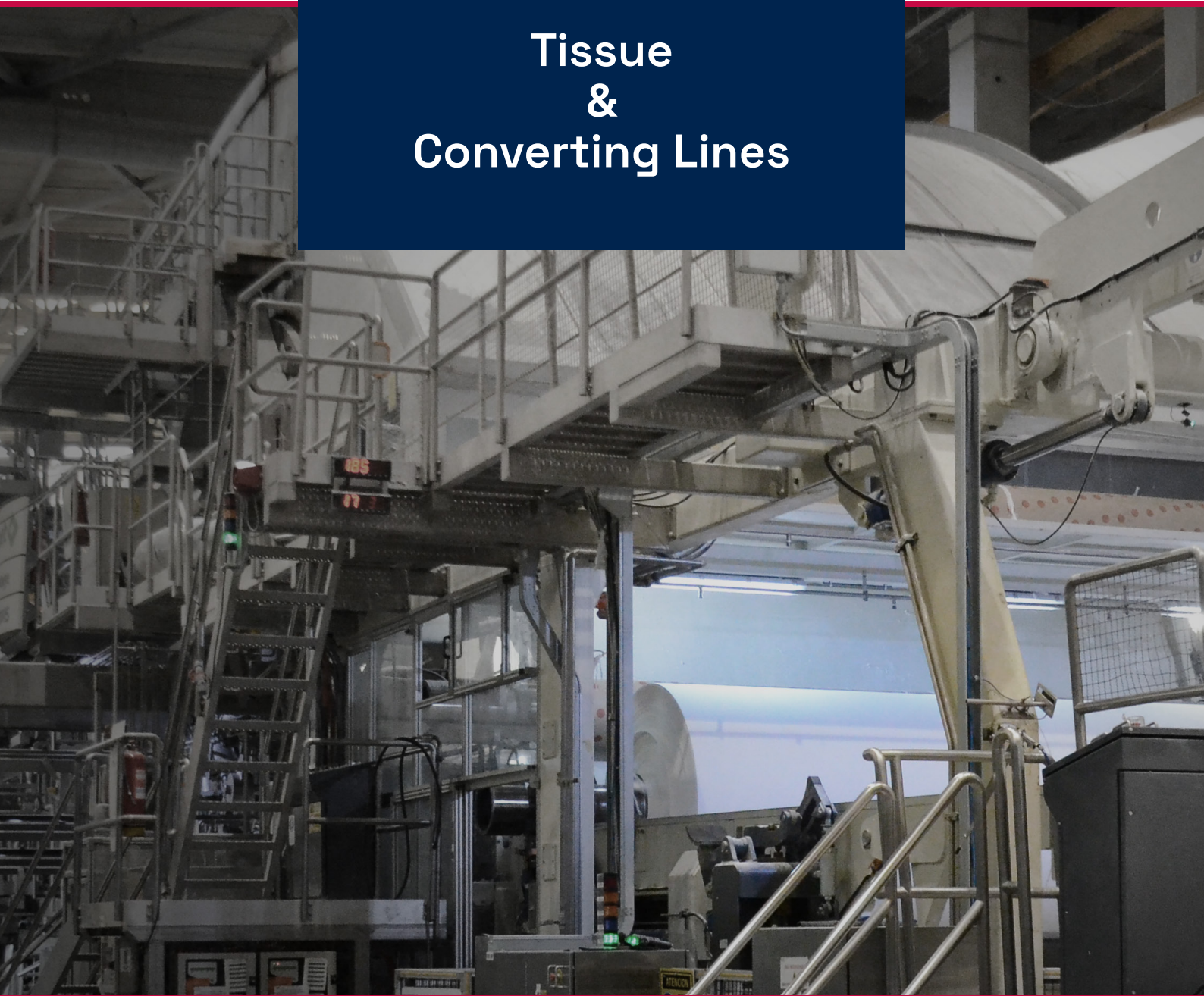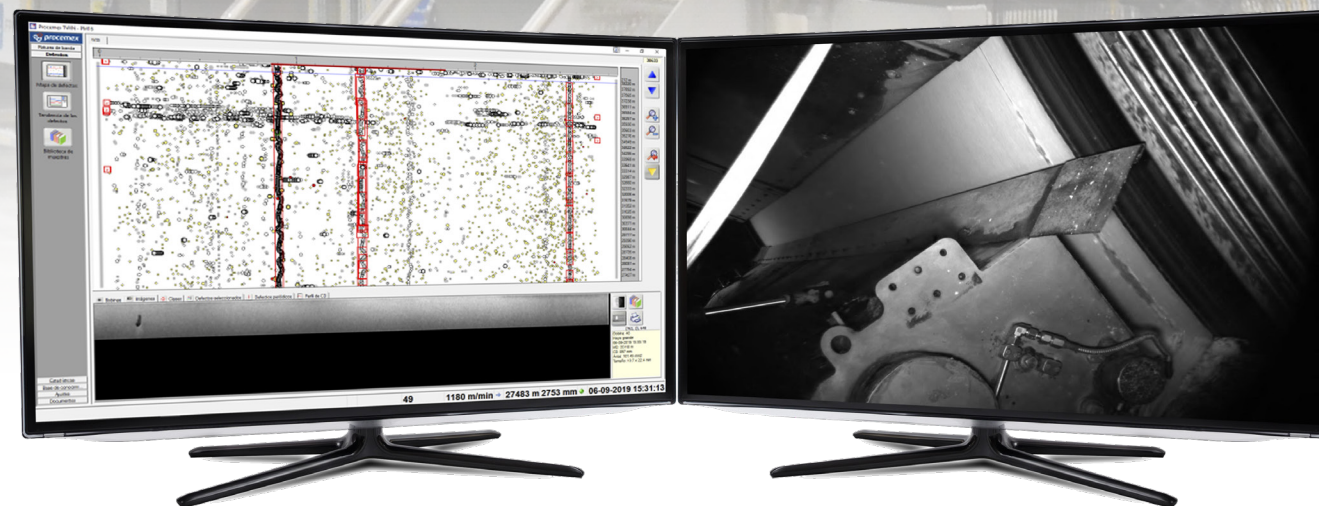# procemex
One Platform

Tissue
&
Converting Lines

procemex®

Future Proof & Backward Compatible

OnePlatform for Tissue
– Procemex Fully Integrated Solution

Introduction

Procemex OnePlatform for tissue covers your quality and efficiency improvement needs on your tissue machine and converting line. It also makes it safer for operators to monitor key locations of the machines. Key elements for problem solving and troubleshooting on a tissue machine are Web Inspection and Web Monitoring systems. The paper defect and web break root cause information captured is used to reduce the number of web breaks and control product quality. In addition to that, the critical data is transferred with reel defect maps into converting lines to enable smart decisions supporting higher converting line runnability.

Building defect detection on OnePlatform architecture has elevated Procemex to the leading position in the global surface inspection and monitoring market.

What Does OnePlatform Mean?

Our customers have a common question; "What is the difference between the Procemex solution and if we buy the Web Inspection system, Web Monitoring system and further vision application separately? This question can have different answers to different groups, as it touches operators, production management, quality assurance, IT, maintenance and project engineers. The basic elements are always the same.

OnePlatform - One User Interface

The intuitive user interface is not designed for analysing tissue web breaks and defects separately. It has been designed to form a single unified user interface making it easy for operators to understand the relationship between defect and root cause and move seamlessly between the Web Inspection and Web Monitoring system. This makes it easy for operators to understand the real root causes for paper defects and web breaks created in earlier process stages.

- One interface for Web Inspection & Monitoring
- Web Inspection and Web Monitoring cameras synchronized with each other
- Pre-configurable paper defects activate Web Monitoring cameras
- Upstream root cause video evidence is only one click away
- Upstream monitoring camera access with red button at the side of defect map
- Web Inspection camera displayed is synchronized with Web Monitoring cameras
- Intuitive navigation to different archives such as breaks, defect root causes and events

OnePlatform for IT

Procemex Smart Cameras process the data already inside the cameras and send the results via TCP/IP Network to the server, therefore only one server is needed for the whole system. It manages SQL database for storing and distributing data and communicates with 3rd party systems. Having one computer for the whole system data processing is beneficial, as it:

- Enables system virtualization by using Procemex server
- Enables system virtualization with preferred customer hardware and service
- Enables parallel server replication
- Enables easy backups

OnePlatform for Maintenance

In addition to the shared data storage infrastructure and user interfaces, it also plays an important role, that there is only one application software covering both web inspection and monitoring. This makes it easy for maintenance and application engineers, as everything is handled in one unified way and there is no need to learn two systems. Web Inspection and Web Monitoring also share same lighting and Smart Camera matrix technology eliminating multiple spare parts and extensive troubleshooting efforts.

OnePlatform for Support

When our customers need us, our project managers, field service engineers, remote service engineers and service teams can quickly provide support for both Web Inspection and Web Monitoring. OnePlatform allows our support team to help you without application boundaries.

OnePlatform for Longer System Lifetime

By dweveloping our own Smart Camera technology in Tampere, Finland and continually pushing the boundaries of camera performance, we have been able to go beyond the compatibility problems of fast turning computer and off-the-shelf camera world. It seems that the systems built on standard technology today have an average lifetime from 5 to 7 years due to component obsolescence from OEM hardware manufacturers and lack of new components compatibility. Procemex builds systems that are future proof and backwards compatible. This is our promise to our customers, and it is one of our key values in Smart Camera development.

All Procemex systems starting from 2002 are compatible and can be extended or upgraded.

Web Inspection

Procemex Web Inspection System provides you continuous detection of all paper defects plus a seamless integration to OnePlatform System. Procemex develops and manufactures their own Matrix Smart Camera and LED lights specifically for the pulp and paper industry.

High Quality Photographic Imaging

- Matrix Smart Camera provides superior image quality with high speed machines
- Smart Camera auto shutter provides even exposure and illumination over multiple grades and shades of color, which enables fully automated grade settings
- Industry leading camera sensor light sensitivity and image bit depth
- Up to 700 MHz real time data processing inside the camera which is over 5 times faster standard Gig-E Data Protocol solutions

Web Inspection Solution

(5600 mm/220" machine width) with discrete pinhole cameras and discrete strobe LED- lights
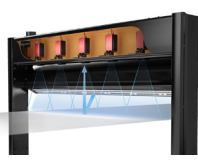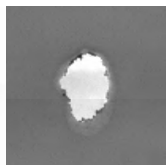
Powerful LED Strobe Lighting

- Smart Camera pulses LED strobe only during image exposure; reducing heat generation due to decreased illumination time which significantly extends the life of the LED
- Strobing provides powerful illumination peak to stop the web movement, eliminate blur and produce photographic image quality

- Any LED segment can be changed at any time without creating a degradation in detection performance and the overall capabilities of the system
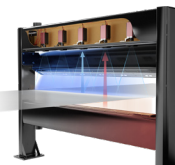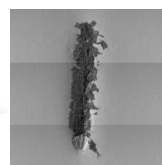
Different Detection Geometries

The Smart Camera can make several independent measurements by pulsing different LED light profiles to flash sequentially for alternating inspection
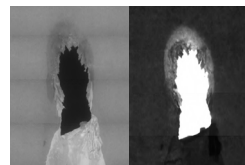

Transmission
Web Inspection

High Angle Reflection
Web Inspection

Alternating Light
Web Inspection

HD Pinhole Cleaning Concept

Web Inspection is typically located at the end of tissue machine in dusty environment. Unique patented pinhole camera beam or separate pinhole camera housing keep cameras clean.
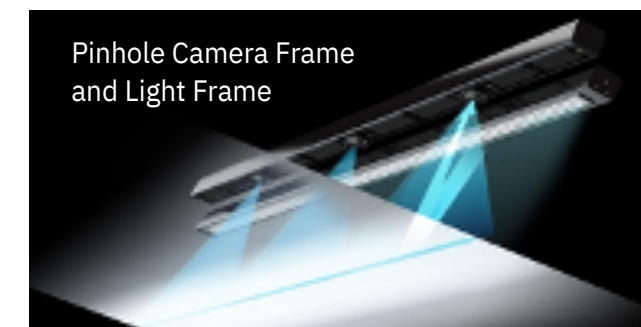
Installation Options

Utilizing Procemex carbon fiber beams guarantees evenness of illumination and a long-term alignment of cameras and lights. In case there is not enough space or if a lower price option is preferred, it is also possible to use separate cameras and lights for the same purpose. This leads to more uneven illumination and extra maintenance/alignment work on cameras and lights is necessary over the lifetime of the system.

Classification

- Matrix camera imaging provides higher quality images to the classification engine and increases accuracy over antiquated line-scan technology
- Procemex utilizes a floating defect filter to reliable separate defects in the sheet from floating dust and debris in the area
- Smart Camera enables direct pre-classification in the camera and real-time outputs are available for external use
- Post-classification beyond single inspection frame measurement utilizing all data available for the most accurate classification
- Advanced Classification utilizing the VisionAppster Platform for developing and acquiring tailored traditional and neural network classification algorithms

"All Procemex systems delivered since 2002 are fully supported and compatible today"

Pinhole Camera Frame and Light Frame

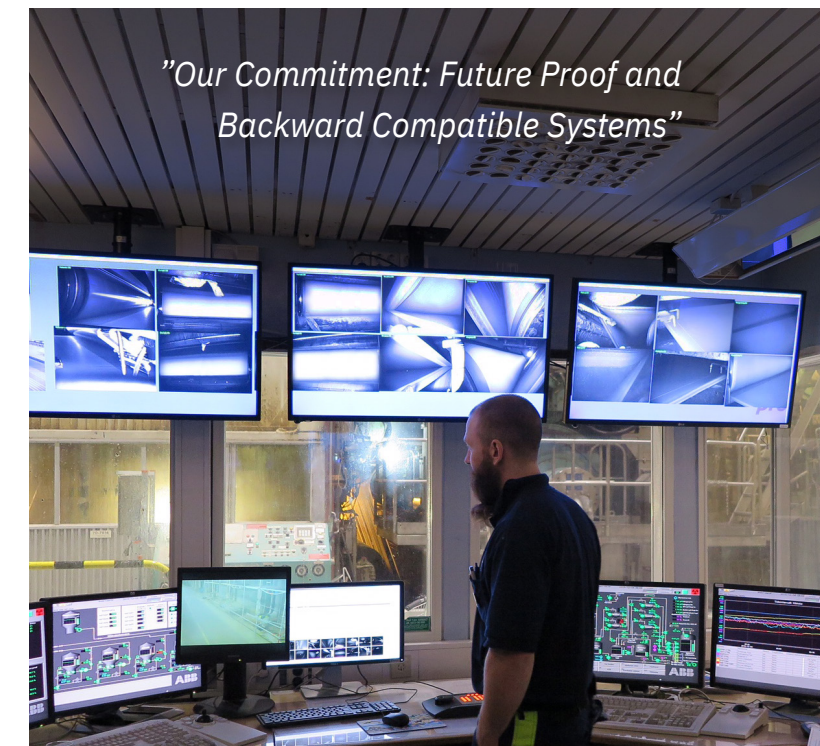Separate pinhole cameras and LED strobe lights

Automatic Winder Target Control

A marker located at the end of the tissue machine puts an ink code with the MD position information on the edge of the sheet. A reader on the winder reads the code and synchronizes the defect map with the actual current position and enables an automatic stop or crawl function to react on customer defined defects.
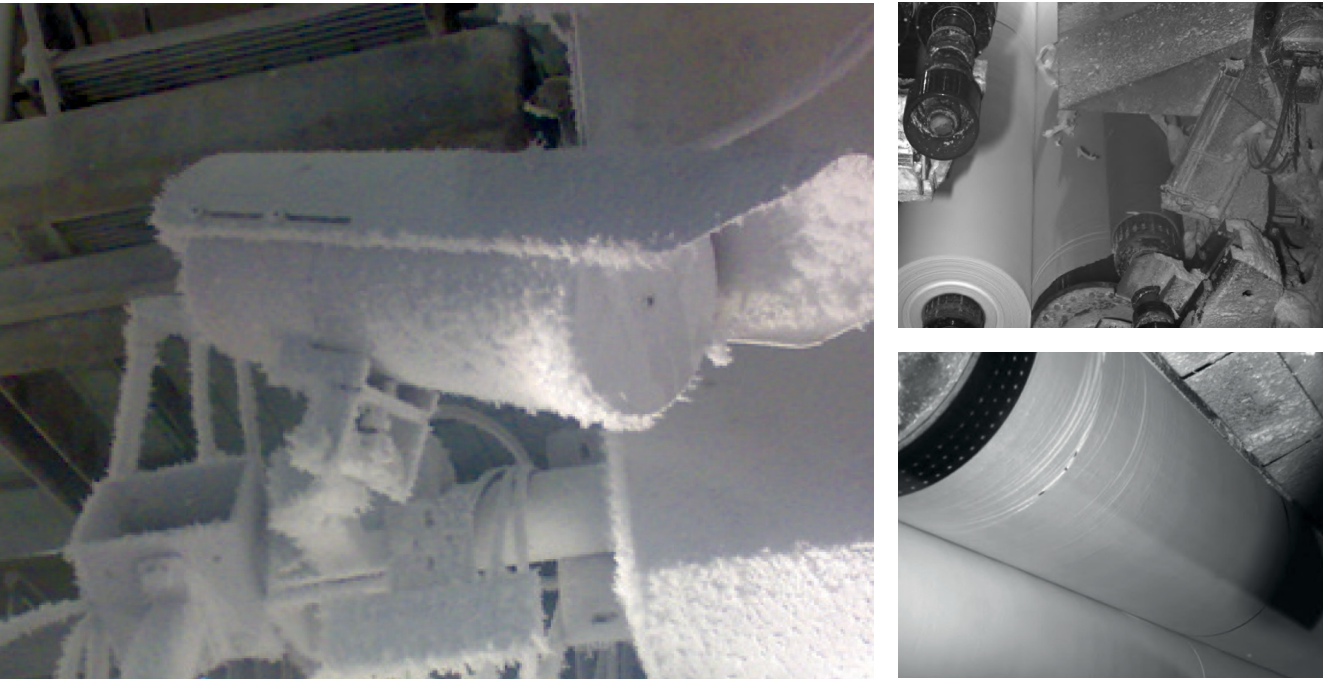
- Automatic reel and defect map loading
- Customer roll set position can be overlaid
- Selected slow down or stop targets indicated on defect map

Pinhole Cameras filming Creping Blade / Edge Crack

General System Features

- Reel number and paper grade imported and displayed
- Hide and unhide defect classes on scrolling defect map
- Possible to zoom in or zoom out defect map to cover several paper reels at the same time
- Planned customer roll set can be overlaid on the defect map and defect density by roll can be highlighted by color

- Repeat defect alarms based on 100+ machine elements such as fabric length or roll diameter
- Defect trends and reports by user defined time period
- Formation measurement
- TAPPI/ISO - dirt count capable

"Our Commitment: Future Proof and Backward Compatible Systems"
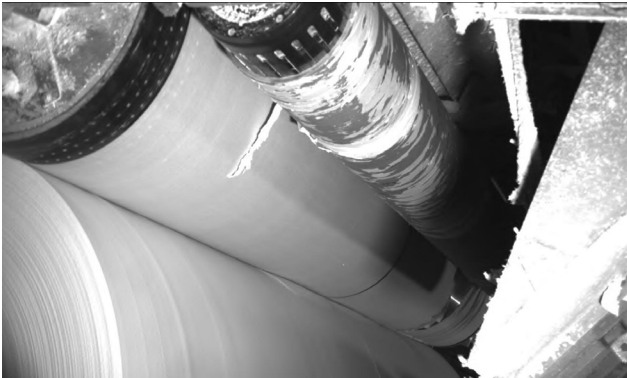
Web Monitoring

Procemex Web Monitoring Cameras strategically placed along the tissue machine provide additional eyes for operators and the necessary information to determine the root cause of a web break and seamlessly

integrates into the OnePlatform System. Procemex develops and manufactures their own Matrix Smart Camera and LED lights specifically for the pulp and paper industry.

High Quality Photographic Imaging

Camera resolution tends to continuously advance and with today's camera technology it is more important than frame rate. In many cases it is difficult to utilize higher resolution cameras as the system is already using its full data transfer capacity. This is the common reason customers need to upgrade their system.

This is especially relevant as 1 GigE network supports only 2,1 MP resolution with 50 frames per second (fps) or 1,9 MP with 60 fps, resolutions above that are not possible without reducing frame rate.

- Procemex Smart Camera resolution is not limited because the camera processes all the data in its own shell
- Complete video file is transferred to the server over TCP/IP network
- Architectural difference enables Procemex to take the next step in direction of 12 MP camera resolution

Powerful LED Strobe Lighting

- Smart Camera pulses LED strobe only during image exposure; reducing heat generation due to decreased illumination time which significantly extends the life of the LED
- Utilizes indirect cooling unit that can use instrument air or water, that does not enter the light, eliminating the possibility for over-pressurizing and causing the window to explode.
- Strobing provides powerful illumination peak to stop the web movement, eliminate blur and produce photographic image quality

- Lights are kept clean by applying a thin water layer on top of the protection window, this cleaning water can be used to cool the light

HD Pinhole Cleaning Concept

As most of the cameras are located in wet or dusty positions, it is clear that keeping cameras and lights clean in harsh environment is most important. Procemex R&D has focused on perfecting HD Pinhole camera and image quality
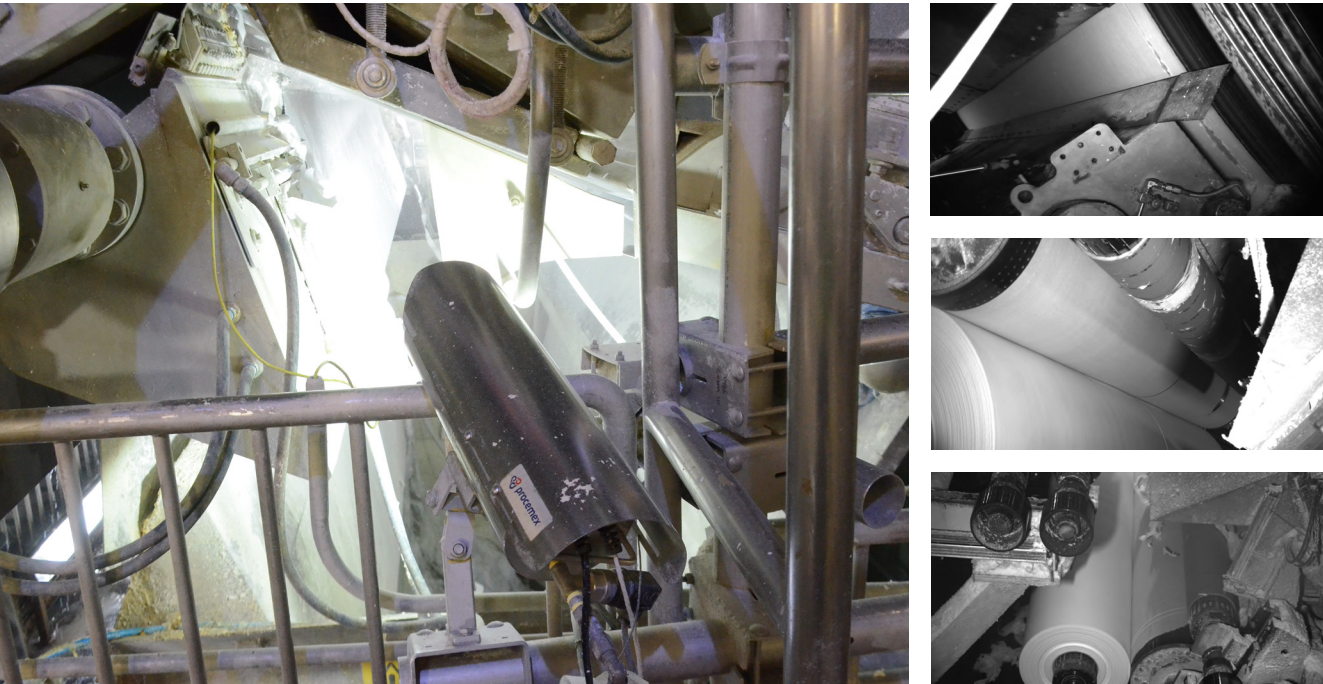
- Procemex designed an industry leading pinhole housing cleaning concept
- Pressurized air discharging the front of the camera housing prevents particles from contaminating the lens
- Maintenance free

Maintenance

A common reason for poor image quality is a lack of maintenance. Contaminated camera and light windows decrease available light which reduces the camera shutter speed leading to poor image quality. Real time images might look acceptable, but the camera can't stop paper movement and recorded videos become blurred. Web Monitoring field equipment should be included in preventative maintenance routines. Procemex offers various service elements from remote service to onsite support.

General System Features

- Superior resolution with 2,1 and 12 MP Technology
- Cameras monitor paper and fabrics related issues
- Cameras are synchronized with each other with the accuracy of two frames
- Each camera features Region of Interest (ROI) to concentrate on a particular section of the sheet

- Image trending provides information on when significant events occur in the video
- Bookmarks can be tagged on images and image trends and video clips can be edited as needed
- Defects and root causes identified quickly for more efficient troubleshooting
- Real time images are available

Strobe LED light

Housing for HD Pinhole Camera

Procemex Smart Camera

Service & Support

Focus on high productivity, reliability and performance

To ensure the reliability of your machines and processes and maintain good product quality, it is essential to keep your machine's vision system at its optimal level throughout its entire lifecycle. We strive to be your partner in continuous development by providing you with the latest advancements in vision systems.

We offer upgrades for your existing camera system, to optimize its performance. Our full-scale service portfolio includes everything from 24/7 connected remote services to preventive maintenance and smart spare parts services.

We are committed to supporting your vision system's best performance and optimized maintenance throughout its lifecycle.

Service Agreement

Regular scheduling and proactive service can decrease maintenance costs, optimize production quality, and minimize web breaks. The Service Agreement is customized to meet each mill's individual needs. You can select services from our modules to ensure smooth system performance and modify the agreement as needed. Our collaboration through the Service Agreement ensures continuous system performance improvement.

System Security & Software Updates

Annual software updates improve system performance, maximize its lifespan, and offer new features with improved data security. We plan and execute updates effectively and systematically with a service agreement, ensuring smooth system operation. Our data and system security services provide secure data backups, ensuring fast and reliable system start-up in case of problems or system failure.

Remote Services

We offer Remote Services for web inspection and monitoring systems to resolve issues from anywhere, anytime. Our team ensures high-performance levels and quick response times. Over 90% of issues can be resolved remotely. We provide comprehensive reviews and suggestions to enhance system performance.
Count on us for timely support, available 24/7.

Onsite Services

With our Onsite Services, you can ensure maximum reliability and optimal performance of your vision systems. We offer systematic and continuous system audits, along with well-scheduled onsite maintenance services, to guarantee a reliable operation of the paper machine's vision system. This, in turn, enables you to optimize the entire papermaking process, ensuring its smooth and efficient functioning.

Spare Parts & Repair services

Procemex provides readily available OEM spare parts with the right software and setups, along with repair services for cameras, lights, and PCs. We maintain comprehensive spare parts inventories globally and can set up one at your site for critical parts.

Training

The effectiveness of a Web Inspection and Web Monitoring system relies heavily on the operators utilizing it. Our goal is to ensure that you maximize your investment by providing your operators with the necessary skills to achieve success. We offer a diverse range of operator training programs tailored to your specific needs.

System Modernizations & Virtualization

Upgrade your system with our modernization packages for better performance and extended lifecycle. Enjoy flexible and cost-effective upgrades in smaller steps.

To ensure a fast recovery from unexpected situations, we can have your existing system virtualized resulting in improved data security and reduced downtime.

System Extensions

We develop future-proof systems that are also backward compatible. Our systems can adapt and extend easily to meet changing demands, enabling significant cost savings without investing in a new system. With our System Extensions, you can enhance your current Procemex WMS/WIS system with new functionalities. Our hardware and software are fully compatible with our older systems and can be customized to meet your production requirements.

procemex

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