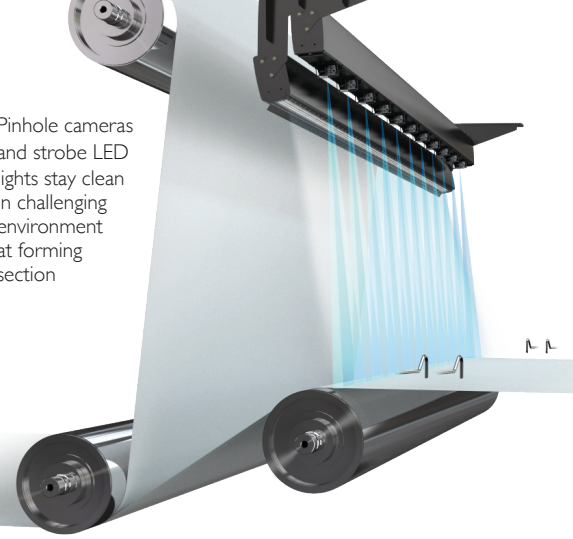


WEIG-Karton – Results with web inspection at former and press section

Pinhole cameras and strobe LED lights stay clean in challenging environment at forming section



Weig-Karton in Mayen in Germany



WEIG-Karton runs one of the biggest recycled board mills in Europe. The mill produces folding box board for the packaging industry and technical board for the building industry.

Web Monitoring Vital to Product Quality

In the paper industry, customer requirements are constantly increasing and product quality has to be continuously improved. WEIG-Karton has introduced intensive quality control processes in order to match and exceed their customer's expectations.

WEIG-Karton has been working closely with Procemex since 2009 to improve the optical process monitoring on their folding box board line. Initially a fully integrated Procemex web monitoring and inspection system was installed. In 2013 the resolution was doubled by updating the cameras to the latest FullHD technology, and the potential for product quality improvements was further increased.

Weig & Procemex collaboration for excellence

In 2013, WEIG-Karton decided to fit their gypsym liner board machine, KM6, with a portable high speed camera system. Four FullHD pinhole cameras were installed at the wet end of the machine to improve troubleshooting accuracy.

This new setup proved to be a great success: it helped the operators to focus their troubleshooting in the right areas of the wet end. The success of the first experiment lead to further innovation collaboration between WEIG and Procemex. Together the teams developed a deployment concept of a camera system that would cover all of the board machine, not just the wet end.

Seamless inspection on extreme areas

The team's ground-breaking idea was to monitor the wire with a pinhole web inspection beam. Procemex had previously used camera beams to inspect pick-up areas with promising results, and they had developed a pinhole beam technology for full-width web monitoring and inspecting extreme areas of paper machines. The technology guarantees seamless inspection without any disturbances brought by conventional cleaning mechanisms, such as wipers.

Thanks to the new technology, web inspection beams can be used in even the most demanding areas of paper and board machines.

This was the preferred beam technology for the exit press section and the sizing press entry. The same image resolution could be used in all 3 beam positions in order to compare events with each other.

Single pinhole cameras were installed alongside the beams on the headbox of the KM6. Now defects and their root causes can be identified quickly through a process of elimination.

Ambition leads to success

In order to develop a comprehensive solution for the KM6, additional web monitoring cameras were installed at 2nd press, pre-dryer section and exit from size press.

Thanks to experienced and dedicated teams at both WEIG-Karton and Procemex, the system was completed in August 2014. Procemex trained WEIG operators and engineers to operate and take care of the system in efficient way. Today, a total of 40 single cameras are used to monitor the process and quality of their paper machines, and three 42" monitors display live images of the production.



Board Machine KM6



Pinhole camera beam above forming section of KM6



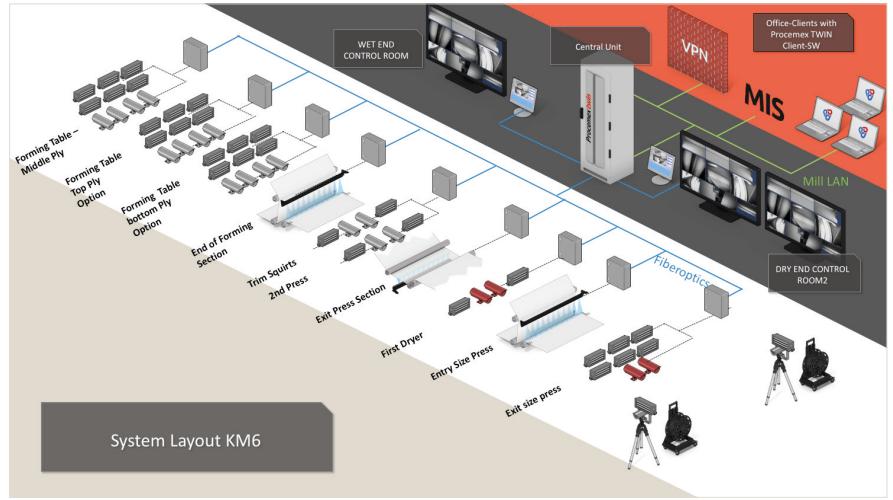
Pinhole beam-exit press section of KM6



Pinhole beam – entry size press of KM6



Forming table of KM6 after headbox



System Layout KM6

Statement from Henning Dippel, KM6 Operating Manager, Weig-Karton:

“After the commissioning we could see a major improvement in process monitoring quality. The reaction times were significantly reduced.”

“In addition to defect detection, the condition monitoring of wires and felts plays a significant role in ensuring the economic operation of the material. For example, a hole in the 3rd dryer group felt and wire defect in the former section could be quickly detected and corrected.”

“It is not just the image quality and work of Procemex that impresses me. The intensive partnership and results oriented co-operation are essential success factors for a sustainable quality control.”

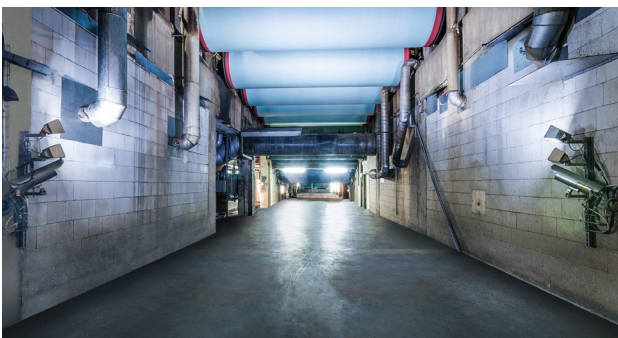
Statement from Mika Valkonen, CEO, Procemex:

“Procemex pinhole camera and LED light beam technology are specifically developed for the most challenging wet end and finishing area environments. It is essential to analyze and understand the root causes of web breaks and defects, and eliminate them quickly.”

“We started developing the wet end frame concept in Finland 3 years ago. The first pinhole camera beam was installed under the pick-up felt of a paper machine. This turned out to be very helpful in solving runnability issues and improving machine efficiency. We soon realized that the concept also works in several other positions where conventional solutions cannot stay clean enough to perform.”

“Monitoring the forming area is very important, as typically 80-90% of web breaks originate there.”

“Collaborating with innovative clients like Weig-Karton pushes our process and quality understanding forward, beyond conventional boundaries. This is the only way to improve machine efficiency and product quality.”

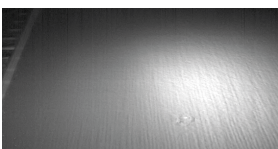


Dryer group of KM6



KM6 control room

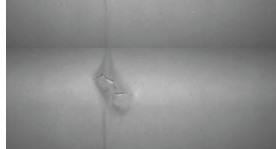
Event 1. Web break takes place at size press. Root cause can be seen at the end of forming section and on forming table (Resolution 1,1 x 1,1 mm covering full machine width)



Forming table after headbox



End of forming section / before pick-up

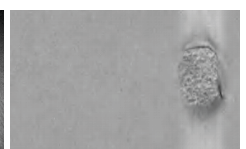


Size press

Event 2. Web break takes place at size press. Root cause can be seen at the end of forming section and on forming table (Resolution 1,1 x 1,1 mm covering full machine width)



Forming table after headbox



End of forming section / before pick-up