



Mill Reduces Winder Break Using RYECO's Edge Crack Detection System

Application

The runability of high-speed paper machinery can be adversely affected by paper edge defects- cracks, folds and tears. It is essential to detect these flaws before a realistic solution can be devised. The question is how can you positively identify these tiny flaws at a web speed over 3,000 fpm?

The Communications Paper Division of a Canadian mill suspected that edge cracks were the cause of many of their winder breaks. They were having six to seven breaks per day on the winders and each break lasted about 20 minutes. They needed a detection system to see the edge cracks, solve the problem and thereby avoid winder downtime.

After a technical evaluation, an edge crack detection system was installed on the paper machine.

The System

The Edge Crack Detector sees unseparated cracks. The RYECO on-sheet detector employs a unique air jet deflection system that temporarily separates the crack, allowing the optical sensors to see through and identify the flaw before it becomes a fold or turnover. The air jets also purge the sensor of dust, thus avoiding frequent cleaning.

The system inspects the sheet on the front and the back edges and provides a visual indication of the fault location with a color-coded edge marker on the tending side. Also included in the system is an Edge Tracking Module that automatically adjusts the sensor position if the edge changes. The system is programmed, through a membrane keypad on the base module, to respond to different fault classifications and to mark the sheet edge with up to six different colors. The system can also accept inputs from other online measurement systems and mark the sheet as programmed.

Customer Benefits

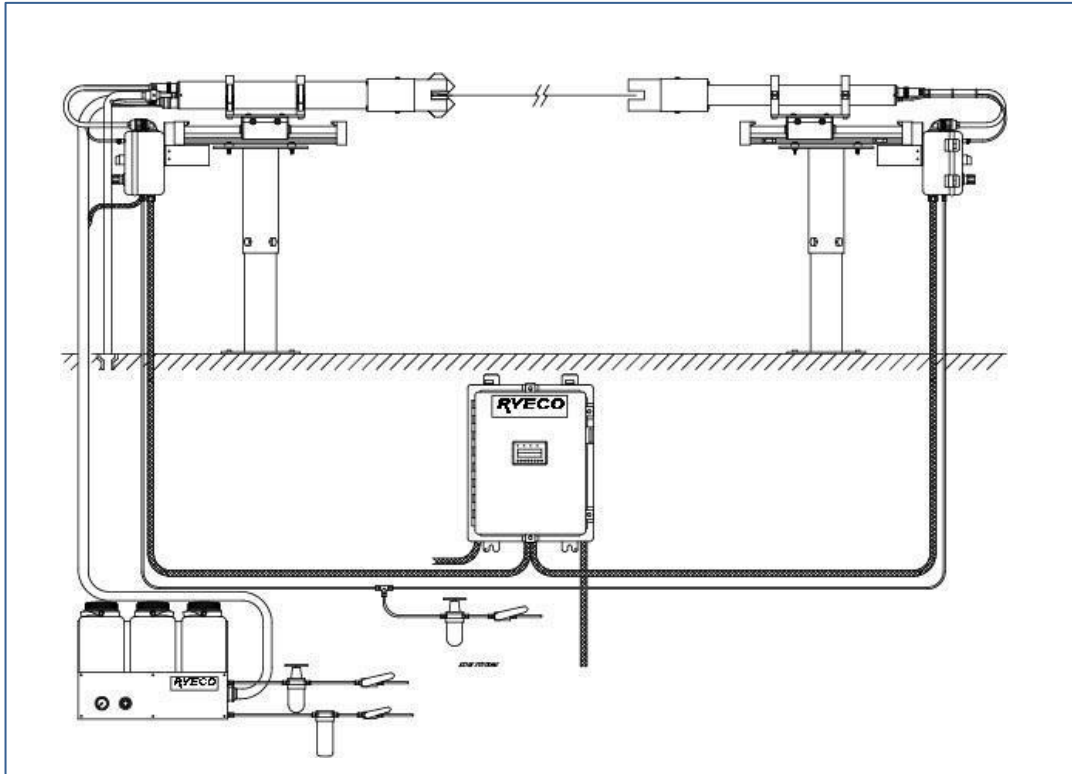
Reduction in Winder Breaks: The positive results on the PM winder were almost immediate. The winder breaks were reduced within the first two weeks to three a day. These results were achieved solely by identifying the problem but not yet solving it. Using the color edge marker as an indication of fault location, the winder operators reduced the winder speed as the fault approached, minimizing the potential for a web break.

Identification of Flaw Location: A diagnostic program was implemented to isolate the causes of the problem. The RYECO systems are programmed to identify, by edge-mark color-coding, whether the flaws are on the front edge or the back edge. The well-defined mark endpoint allows the winder operator to stop the winder to within one foot of the fault. The flaws could now actually be seen and cut out.

Identification of Source of Web Breaks: Operators were able to identify several sources, including the former squirt, the press section and size press. The discovery that faults could occur at the size press prompted the mill to subsequently install detectors prior to the size press. In addition to the real-time diagnostic capability, each system transfers historical fault information via a data link to the machines' DCS. Daily and monthly reports on edge-crack frequency and location are generated.

Solution

Once the potential sources were identified, edge cracks could be dealt with on a systematic basis. The machine operators developed a routine. If edge cracks occur, they looked for the likely causes. By this problem-solving approach the mill reduced its winder break frequency to about one per day, a reduction in more than 80% compared with baseline levels. Runability had also reported to improve.



RYECO's System II Edge Crack Detection and Marking System