

Technical Bulletin

Paper companies are pushing high-speed lines in an effort to maximize product output. Equipment is often pushed to or past designed operational speeds in an effort to meet production goals. The results are often difficult to achieve due to breaks in the web that create lengthy down time periods.

Problem

Paper manufacturing engineers and line operators are often faced with high-speed manufacturing lines that are down or producing faulty paper, often to great expense to their company. A web break that causes 20 minutes of downtime on a typical 325-inch wide web that runs at 60 feet per second can result in approximately 2 million feet of lost paper productivity. In an effort to see what causes web breaks most paper manufacturers have installed video cameras to monitor the web at the wet end, flying splice and other problem areas. These video cameras, operating at 30-60Hz are fast enough to "see" the problem, but not fast enough to solve the problem. For example, on the wet end, you may need clear images of fiber alignment, to actually solve the problem.



Solution

High-speed digital camera systems with proper setup and lighting provide clear images of great detail. The high-speed pictures (record rates exceeding 1,000 frames per second) can be instantly played back in slow motion or on a frame-by-frame basis to allow the observer to see, measure, and understand the fast mechanical motions that are causing the manufacturing problems.

Designed To Capture Random Events

With the slow-motion camera in the record mode, signals from two web break detectors create a trigger signal (confirmed web break) that is received by the camera and the recording process is stopped. Images of the event are ready for playback and analysis, providing vital instant feedback on what went wrong and which measures have to be taken to correct the problem. This is an example on how the use of high-speed imaging can reduce manufacturing costs and increase profitability by helping to reduce line downtime and changeover time, reduce waste, improve yield and improve product quality.