

Technical Bulletin

Paper Manufacturing

Paper companies are pushing high-speed manufacturing 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 downtime periods.

A typical manufacturer in the paper industry must address the following questions:

- ➔ Does the manufacturing of paper products run without defects or excessive material waste?
- ➔ Are manufacturing lines achieving production goals (desired run rate, minimum down time)?
- ➔ Do production processes (such as a flying splice) run without manufacturing problems?

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. The video camera pictures are often of little or no value since they are acquiring pictures at only 30 or 60 pictures per second. Web breaks are simply too fast for these cameras, often capturing only one picture of the failure. There isn't enough picture information to help the engineers and operators observe failure dynamics. Engineers and operators can spend significant time and money trying to solve the unseen problems.



Solution

High-speed digital camera systems provide an easy method for observing web breaks and mechanical processes under real production situations. The high-speed pictures (record rates up to 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 creates 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.

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