High-Speed Cameras Focus on Solutions

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It takes just a blink of an eye for a packaging line to jam. But in that split second, a company can lose valuable time. And, as the old saying goes: Time is money.

Everyone works to remove the source of line jams. Of course, in order to fix the root cause of an issue, you have to be able to see the problem occurring. This is not always simple, especially with increasingly complex packaging equipment moving at ever-faster speeds. When breakdowns happen once a shift or at an unknown time, the odds are slim-to-none the issue will be seen—unless you have a system capturing activity at the appropriate frame rate for long periods of time.

Traditional high-speed camera systems compromise their ability to track the specific causes of failures. These camera systems are typically only utilized for what are considered "major" problems. Still, when one considers that "minor" short stoppages add up to 5% to 10% of daily efficiency loss, it's easy to see how their elimination can drive savings to a company's bottom line.

But a new breed of cameras—combined with accompanying computer technology—can continuously record operations and permit slow-motion replays of process upsets, a feature particularly useful for those glitches that occur only sporadically. Plus, these high-speed cameras are easy to operate and don't require an electrician to wire up and operate like their relatively antiquated ancestors. In fact, it's not unreasonable to expect 30 to 40 employees to become well-versed on how to use these new cameras with a minimum of fuss. After all, video is a language everyone understands.

The benefits of an easy-to-use, operator-friendly high-speed video system make an immediate impact through:

- increased line speed by eliminating unnecessary dwell times;
- decreased off-product quality and waste;
- improved line efficiency by pinpointing the root cause of jams;
- ability to download clips and communicate with suppliers, sister plants, OEMs and vendors (amongst others);
- decreased change-over time and improved start-up efficiency; and
- enhanced training and documentation by using video clips.

These benefits generally provide a return on investment in as little as one to two months. In that amount of time, companies can truly get a handle on the causes of intermittent failures, which may include:

- off-quality and off-spec materials;
- temperature and humidity variations;

- timing issues with machinery;
- improper machine setups and tolerances; and
- equipment wear and vibration.

Can I get a witness?
Ever consider the likelihood of witnessing a problem at the perfect instant in time? Impossible. Even if an employee could spot a jam while it occurs, chances are he cannot determine its cause due to the speed of the line. Your employees should supervise line operations, not attempt to spot intermittent failures.

Utilizing first-generation cameras doesn't meet the needs of today's operations, since they only have roughly 10 to 60 seconds of memory. By comparison, the next generation of cameras is capable of preserving five to 40 hours. That length of continuous recording permits slow-motion replays and concurrent recording of current events in real time while reviewing past-incident events.

Light conditions do not present an issue. Ideally, a camera now should be like using a camcorder when it comes to lighting requirements. Unfortunately, first-generation cameras lag behind this standard and have to be tuned to the n^{th} degree to work, and also require specific light conditions.

Suppose a plant's Good Manufacturing Practices (GMPs) require all exposed glass to have a plastic cover. With a first-generation camera, the light requirement is likely to be so bright it could melt the cover. Not so with the new camera systems.

The state-of-the-art, high-speed cameras offer tremendous flexibility with numerous modifications available, such as:

- splash-resistant/water-resistant equipment for food-industry uses;
- wireless cameras for use in pharmaceutical clean rooms;
- air-conditioned, water-proof equipment; or
- explosion-proof camera carts.

So it's important for a company to verify that its vendor knows the industry to ensure that the right equipment specifications are available and offered.

Identifying the reason for a stoppage is now simple. These new cameras have an extremely fast shutter that provides crisp images that aid the diagnostic process. Additionally, a process can be viewed from multiple angles. The new cameras are small enough to actually be placed inside a machine in operation, providing views otherwise unattainable due to safety restrictions. Plus, frame-by-frame advancing helps to determine a problem's root cause. Typically, it will take just one or two stoppages before the cause is uncovered and future halts prevented.

Some would ask: “Why spend the money when slowing the line down for a short period of time would show the cause of the jam?” Experts in line-speed dynamics know that slowing down a problem line to examine it doesn’t provide the same picture as real-time conditions. Slowed-down lines don’t operate the same way as when they operate at full-speed; the momentum is different.

Utilizing these new cameras isn’t just about fixing problematic lines, either. In fact, the technology is capable of improving on a smoothly running process. Cameras can help a company increase output. Perhaps a particular machine isn’t running at peak efficiency. Maybe it’s capable of much more that’s just waiting to be harvested. One major food processor discovered just that and used cameras to reduce its equipment dwell time. Now things are “up to speed” and the operation is running at peak efficiency.

Rent or own

High-speed cameras come in many shapes and sizes. And many price levels. Because they require no installation to provide value, often customers will use them in their plants for a brief period to prove the savings potential.

One option that a vendor should be expected to offer is a one-month trial. During those 30 days, a company can evaluate the system and reap the benefits. In fact, it’s highly recommended that any company considering purchasing a high-speed camera system go this route. During this time, a company will be in a position to ascertain whether it requires modifications to the equipment, such as water-resistant or temperature-proof features.

So, instead of remaining blindsided to conventionally imperceptible line glitches, consider sharpening your focus by weighing the advantages a high-speed camera system can offer.

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