Maintaining a competitive edge and improving print quality, while at the same time increasing profitability might sound like an impossible dream, but flexo printers and converters deploying automated, color and print quality solutions along the workflow are making this goal a reality.

There are a number of ways to achieve this, but few companies today are in a position to re equip their entire production lines. Apart from the cost, current market trends of shorter runs and downward price pressures militate against large capital investments. Yet, packaging printers and converters are also facing demands for higher quality and faster turnaround times that test the capabilities of existing equipment. Added to the balancing act are demands from brands for documented evidence of run quality, waste and energy savings to support their environmental policies.

Acting on the general principle that big gains are worth big risks, most converters don’t see the potential and are looking for ways to instead minimize that risk.

ADDRESSING PAIN POINTS

While these pressures create a near perfect storm for businesses, there are opportunities for brands and converters alike, and automation is the key.

Building on the basic—and obvious—proposition that, if you’re printing bad copy or the press isn’t running, then you’re not making money, then the next step is to run the press more and stop printing bad copy. By automating processes that require the press to be slowed or stopped, using reliable print inspection systems to identify and correct print faults, and enabling the efficient removal of defective copy, converters can make a series of incremental improvements.
These improvements go straight to the bottom line and also meet the objectives of cutting waste and improving competitiveness.

To start by addressing the major pain points in your company and to your customers is, again, an obvious strategy. Too often, printers and converters will recognize the general problem all too well, but will not have recognized its cause or solution.

One of the top reasons for job rejection is incorrect color or color variation. Other leading causes are:

- Misregister
- Process faults like streaking and spotting
- Printing incorrect files or files with wrong/missing fonts, images

While web to print has eliminated many of the problems with built in preflight systems and the correctness of the files uploaded is the responsibility of customers, converters will still want to prevent printing bad copy. Prepress faults, like wrong or missing fonts and images, are now also possible to eliminate before the job is run, thanks to PDF verification software that compares approved artwork with the printed copy during setup.

Addressing color issues may also require a change of mindset, but printing to recognized and reliable standards offers a process with documented evidence that provides assurance to both a converter and a customer. It also enables consistency for repeat jobs on different presses or at different facilities. Automatic color measurement offers an inline solution that, once running, does not require the press to be stopped for manual spot checks by visual inspection and spectrophotometer readings.

Devices using spectral response and L*a*b* values deliver highly reliable color measurement for maximum accuracy. Apart from using the live color data to provide feedback to the press operator (via audio and/or visual alarms) so remedial action can be taken, systems can collect and retain the data. This provides a record of color accuracy, press performance and other information that can be used to provide documentation of the run. Such data can inform judgments on comparative press performance and enable faster setups for reprints.

**ACCURACY AT SPEED**

One of the keys to the success of these solutions is the availability of faster cameras that enable the latest generation of presses to perform without compromising print quality at higher speeds. The recommended inspection camera resolution is 250 dpi, although a maximum of 600 dpi is possible. The print width, the minimum defect size and print speed are factors that determine the number of cameras required.

Camera sensitivity is a critical factor, as it needs to detect defects from less than 0.1-mm. to 0.2-mm. across the web, and from 0.15-mm. to 0.35-mm. in the printing direction. This enables the detection of common defects, like the thin streaks caused by doctor blades that, if undetected and not immediately remedied, can potentially run for thousands of feet. The same applies to defect phenomena such as an...
ink splash. The ink drop is spherical as it approaches the substrate, but becomes a long, oval mark, due to the substrate’s relative velocity.

Though these defects might be extremely narrow, they can cause job rejection. Identifying them as soon as possible, wherever they are on the web, is essential.

The nature of the substrate also needs to be taken into account and cameras need to be able to inspect media, whether it is opaque, transparent, translucent or reflective. Since flexible packaging substrates are usually laminates, they have a high value, so waste reduction here can have a significant impact on profitability.

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ELIMINATING DEFECTIVE COPY

The most effective systems inspect 100 percent of the web 100 percent of the time and detect both random faults and process faults like:

- Streaks
- Spots
- Color variation
- Misprints
- Misregister

Systems that enable operators to adjust the tolerances independently for different errors—depending on the application—give converters much greater control over the process. For example, spots are highly critical for health care and pharmaceutical applications, where random ones could be mistaken for decimal points, while color may not be as critical.

Live data collection has been touched on above in terms of press evaluation and reprints, but it can also play a role in the inspection process. Data from inspection systems can be used to control the rewinders, facilitating the removal of defective copy. This not only ensures that all defective copy is removed, but accelerates the process by automatically finding exact positions of defective material and speeding up and slowing down rewinders to locate these at faster speeds than manual intervention.

Each converter will have its own priorities and a slightly different way of integrating inspection equipment, depending on the production line and types of jobs carried out. One factor that may affect decisions is that press speeds can be anywhere from less than 100 meters per minute (mpm) up to 800 mpm depending on press type, substrates and ink used. While most finishing equipment will run in the same speed range as the press, some converters’ finishing lines will run at up to 1,000 mpm, making it possible for one finishing line to process the output of several presses.

This raises the question, “Should I put an inspection system on each press, or one system on the finishing line?”

At QuadTech, we advocate putting inspection systems on each press, so defects can be caught virtually instantaneously and the problems corrected. While more systems are needed, this isn’t a question about sales; it’s a question about ROI, margins and customer satisfaction. Individual converters will need to calculate the payback on multiple systems against the cost of waste that has been fully finished, and it’s not only that: Overruns and reprints to compensate for anticipated and real waste eat into a converter’s overall production capacity—and there is the risk of losing customers.

GREATER THAN THE SUM OF ITS PARTS

Ensuring quality isn’t just about inspecting and removing waste. It’s also about minimizing the amount of waste printed while maximizing press production time and volumes of sellable copy printed. Determining the causes of defective copy is as important as delivering 100 percent defect free print and the recorded job data can be leveraged to create a competitive edge and improve performance.

These incremental improvements in color management and control, automation, inspection and verification using the best possible hardware and software accomplish the goals of improving quality, but they also speed production throughout the workflow.

About the Author: With a strong background in the packaging and converting sector, Stephan Doppelhammer, QuadTech’s market manager for packaging, works with converters to help them adopt strategies for success and profitability and enable them to meet the demands of international brand customers. His role is part of QuadTech’s continuing development of products and services to the global packaging and converting market.

Current solutions for the market include registration, color control, color management and Inspection systems. The range of inspection systems comprises of web viewing, PDF verification and waste management, as well as its flagship inspection system with SpectralCam solution. For further information, please contact sales@quadtechworld.com.