A Recipe for Success

Ink Analysis & Composition Correction

Michael Sisco

Keeping ahead of brand owners' color demands is a constant challenge for flexo printers, and while printing technology has improved in many ways to help them do so, this has also enabled print buyers to raise the bar of their own expectations still higher.

The simple fact is that not every print supplier is proving equal to the task. According to a report from Esko, one-quarter of brand owners report they frequently encounter color inconsistency or inaccuracy; more than half (51 percent) indicate color related challenges cost their organization at least $50,000 per year. And as pointed out in a November 2013 FLEXO Magazine article, as much as 70 percent in reworking costs have to be added to new product launches because of color issues.

One way flexo printers can improve on this performance and perhaps reduce the incidences of customer dissatisfaction is through taking a more scientific approach to color management via analysis and correction of their ink composition. Many do so to some degree already—often through the heroic attempts of a single, color championing individual—but the great majority of printers could realize significant benefits for themselves and their customers by taking a fresh look at their processes for producing consistent, high quality color.

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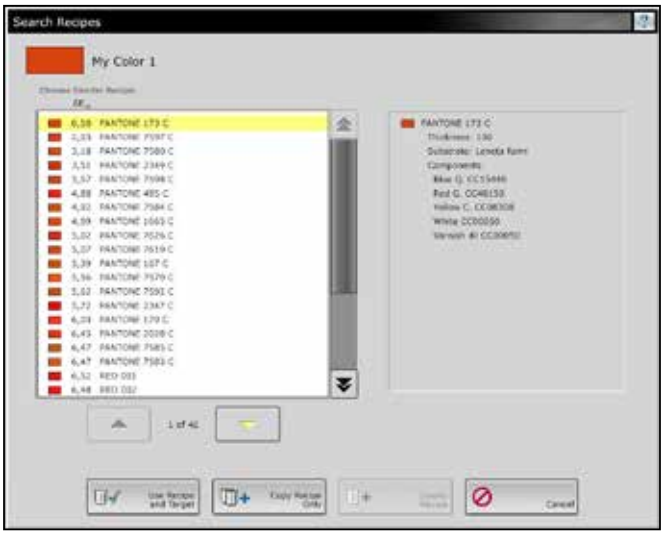
THE PRIMARY COAT

It starts with inline color measurement. Many package printing companies operate purely with sampled measurement, a more sporadic and manual approach. Typically, they will measure color during makeready, stopping and starting several times until they get to color and can begin the run. They will then measure color at the next convenient moment—usually when a reel is being changed—and so the process will begin again. A single reel, perhaps thousands of feet long, might have just one or two sample measurements.

There are many downsides to working with sampled measurement, not the least of which is that flexography, like any other printing



Ink waste can be reduced through the use of software tools that search a recipe database for the best match from previous printruns. Rather than making multiple batches from scratch, existing inventory can be repurposed. Photos courtesy of QuadTech

method, contains inherent variations that make impossible the maintenance of totally consistent color within tight tolerances throughout the duration of a printrun. Sporadic measurement produces only small amounts of data which are of dubious accuracy, since they don't track low frequency variations in the print process. The stop/start nature of making ready and correcting ink blends to achieve acceptable color manually bears costs in both time and wasted resources.

However, makeready is not the main source of time or material savings when compared to the savings realized throughout the run, and with false negative/false positive findings on the entire rolls. Sporadic measurement can also cause enormous waste by rejecting entire rolls when only small portions are out of color spec. Or worse, sporadic measurement can miss out of spec material entirely.

With inline color measurement operating continuously, printers can complete printruns faster and with fewer iterations of the stop/start process. An operator can run up to production speed, verify all is well and only shut down if an adjustment is necessary. Printers will also be able to gather more, better data in real time, which can help them to make more accurate small color corrections to ink blends should drift occur during the run. It enables them to store data for repeat jobs, to identify trends and patterns, and to solve production problems linked to other processes more quickly and easily, knowing the inks are good.

A BETTER BLEND

So, the case for printers to implement inline color measurement is a strong one, but there is more. Technology can enable them to make their ink and color management even more efficient and automated.

Bringing together color measurement with ink recipe correction press side is now possible.

Traditionally, color measurement data had to be sent to the ink kitchen to correct the recipe, but this can now be done at the side of the press, using software and "virtual scales" that can accurately determine the amount remaining in each unit. Printers can therefore track their ink quantities so they know exactly the right amount needed to bring the color back within tolerances, and can make the correction on the fly. Hugely significant savings in time and ink can be realized this way, through optimizing the usage of ink already on the press.

Put simply, integrating the processes of inline color measurement and ink recipe correction in an automated way will dramatically reduce the number of ink corrections that are needed to achieve optimal color, and it will also deliver absolute color consistency from press to press, shift to shift and plant to plant. Flexo printing operations will get to color faster, will be able to spot problems early and make corrections quickly while the press is still running. Fixing scales to each ink tank will no longer be necessary—the virtual scales can handle it with no further hardware required.

"Exact recipe corrections can be calculated automatically and formulation software will tell the operator precisely how much ink needs to be added."

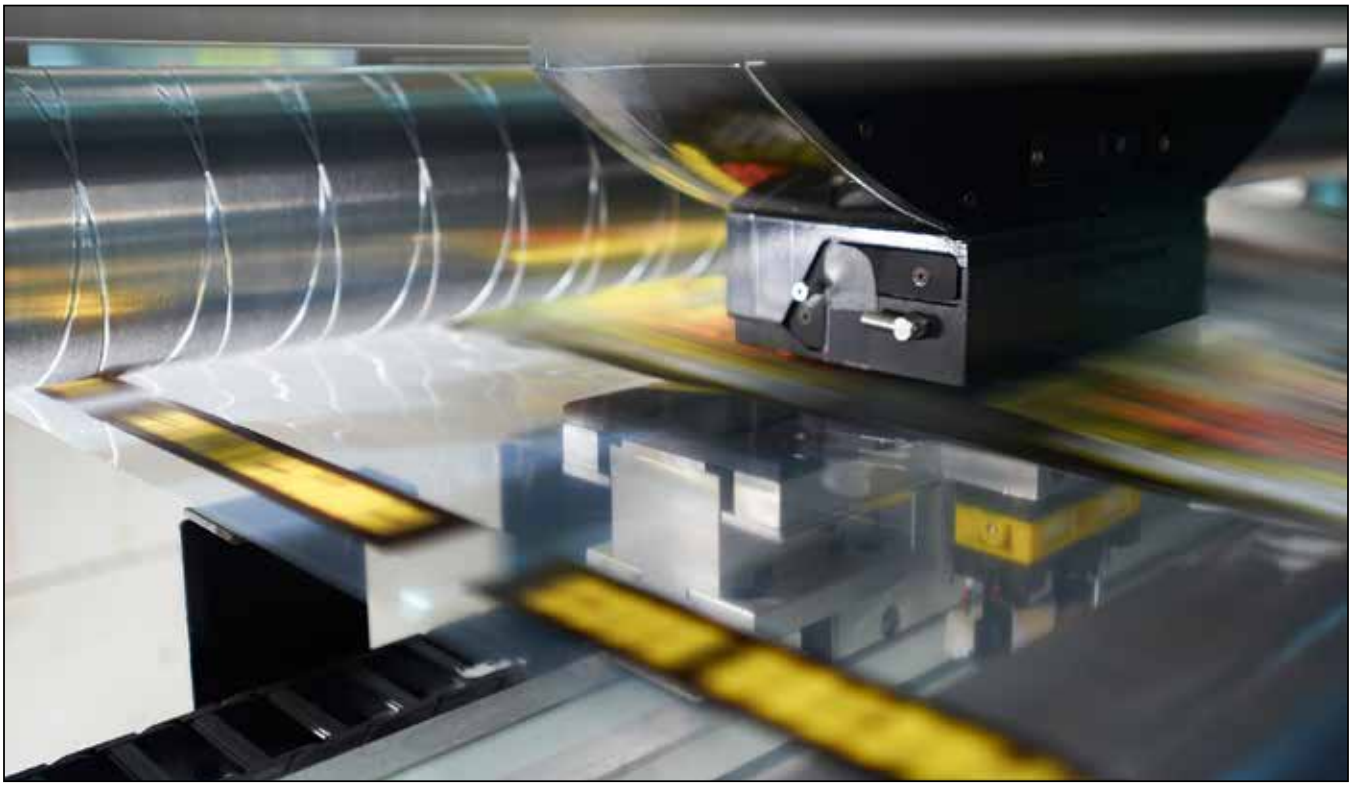
THE PROOF IS IN THE PROCESS

German printer MM Graphia Bielefeld (MMG), part of the Mayr-Melnhof Packaging Group, has tested an ink formulation system—QuadTech's new ColorTrack with InkControl software—which facilitates fast, accurate press side correction of ink formulations.

MMG ran a job that has a particularly difficult color to match to assess the software's capabilities. Typically, the color target can be achieved in seven or eight ink recipe corrections. Using the software, MMG was able to get to within a Delta E of 1.5 in just two recipe corrections.

MMG General Manager Ulrich Hartmann said, "Our operators are impressed. The system is very easy to use and has very high reliability. Our staff was trained and we achieved positive results immediately. We quickly realized the makeready time was going down and thus waste was also reduced."

He added: "Our corporate goals are to increase productivity, reduce waste and increase print quality. With this system, we expect to reach these goals."

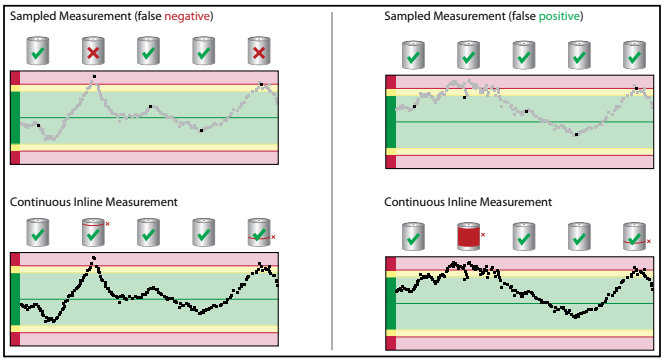


Exact recipe corrections can be calculated automatically and formulation software will tell the operator precisely how much ink needs to be added. Once this has been completed, the inline measurement system will provide immediate feedback on the success of the correction. Such a system could also manage and correct overprints, monitor ink consumption and calculate the correct mix for even the smallest volume.

THE PERFECT RECIPE

In the quest for greater efficiency, printers must grasp every advantage they can. While many have already embraced the concept of inline color measurement, there is still a disconnect between knowing how their press is performing at production speeds and maintaining that performance and speed through changes in the variables that surround the printing process and the consumables it uses.

The future for flexo printers is to remove that disconnect and integrate ink management and color measurement into a single automated workflow for the benefit of both their customers and themselves. Certainty over color consistency, uninterrupted production, less waste and less reworking are among the advantages they will enjoy. Automated workflow solutions promise high return on investment via ink and substrate waste savings. For those that are ready, that future is here now. ■



Sporadic sampled measurement gives an inaccurate picture of print performance, resulting in enormous waste—or worse, defective material being sent to the brand owner.

About the Author: *Michael Sisco is the system architect and a principal research engineer for QuadTech Inc., a leading supplier of control systems and color management tools for the printing industry. Michael has 20 years of experience designing and implementing the electrical and software components of many innovative QuadTech products, and has been heavily involved in the integration of these products into customer workflows.*