Controlling flexo

Banded rolls can be used for a wide range of money-saving and efficiency-enhancing testing procedures. **Mike Huey** at Harper Graphic Solutions explains

Use of banded rolls has helped many printers be more consistent, reduce downtime and minimize the variables through standardizing the process. Well-known applications in the print room include:

- defining precise ink film for process printing
- defining exact line screen and volume for spot and combination printing
- standardizing inventories
- defining the optimum plate durometer, tape density and ink system for a job

These are all great ways in which we can control the variables in our everyday print operations. Flexographic printing is both an art form and a science, and both need to be used to optimize the process and maintain an edge in profitability.

In this article I would like to analyze some of the traditional and non-traditional uses of banded rolls to cut costs and increase profitability.

**Application 1:**
Identifying optimum ink film for line, combo and process printing

**Preplanning**
In order for us to be consistent in our everyday printing operations, we must find the optimum way to define all the variables. This is easily done through the use of a banded roll.

This process should start with a graphic team meeting of plate, ink, tape, anilox supplier and, obviously, the printer. The printer should involve the operator and supervisor as well as a member of the management team for support and buy-in to the project. This meeting should be used to design the roll layout, the various plate durometers to be used, as well as ink and tape. All variables to be tested should be defined along with a plan for measuring and collecting the data.

Keep in mind the ultimate goal is to identify the thinnest ink film to achieve solid ink density for line, process and combination printing and to maximize the tonal range. Keep an open mind, as this may mean that various plate and tape durometers will be necessary to achieve the smoothest, thinnest, most consistent solid ink density.

**Trial Date**
As with any printed job, pre-made ready should ensure all components are available prior to setting up for the trial. Approved “trial” shop orders should be checked for accuracy and treated like a “normal” job, listing variables to be tested in chronological order, samples to be saved, etc. Press, inks, tensions, temperature and all other operational variables should be set as they normally are. If you normally run at 24 seconds #2 Zafan, don’t set up at 28 seconds. Maintain normal printing standard as you usually would run any job.

As you will in most cases have control bands on each end of the anilox—control bands are bands with the same line screen and volume on each end of the roll—make initial pull-ups checking targets on both sides of the substrate to confirm that impression is set evenly across the roll.

Once you have confirmed your impression settings, pull up at normal operating conditions. Document all run conditions of your pull-up on the order and label/code the print samples for future reference and measurements. Organization of the specific testing platforms—labeling samples and documenting print conditions—is key to a successful trial. Save your samples, measure and chart the variables as shown below.

Chart below shows us that the 800 1.9 gave us the closest to our density target and had the best contrast. Although the 800 1.9 had a little more gain than the 900 1.7 we still decided on the 800 1.9 as the gain could be compensated.

**Solid ink density**

After completing the trial, all parties should discuss and determine the specific criteria necessary to achieve the most desirable result. As we know, there is always give and take in these types of trials and the key is laying out all the data and determining where the cost vs benefit will end up. This requires looking at your core business, deciding what your
customers want and expect, and deciding which tape, plate, ink, etc. to use to meet those requirements.

**Application 2**

Banded anilox for white?

Utilizing a banded anilox for printing white has not been as commonly used, but this technique can reduce the costs of putting white ink down by determining the minimum thickness to achieve opacity.

As with our initial banded roll above, this would start in the same fashion, with a team meeting to identify the variables. Finding the correct volume in combination with the right durometer plate and tape to get the smoothest, pinhole-free solid, will be key for this trial.

As we have all learned throughout the years, the less pinholes we have, the smoother the white will appear, resulting in the highest opacity. Although many printers don’t measure opacity, it is necessary if we are to eliminate our hidden costs.

Why do we run 7, 8 or 9 bcm anilox rolls to achieve opacity? What if, by running 8.5 bcm versus 9 bcm we can achieve a 5.5 percent saving in ink cost? What impact will this have on your bottom line? These savings will definitely pay for the trial, banded anilox and additional anilox rolls for white-specific applications.

Whether it is a narrow web or wide web application, white is the most commonly used ink in many shops, and is where the most color-specific dollars are spent. Job-specific money can be saved by reducing the thickness of the white while still achieving the opacity expectations of the customer.

Anilox bcm is not the only factor that influences potential savings. Trials can also be run to utilize tape and plate durometer to achieve the necessary opacity. The illustrations below show a white, utilizing the same line screen, volume and geometry with different plate and tape durometers giving a completely different opacity.

**Application 3**

Banded anilox for coating rolls?

This is one area where a banded roll is seldom used but has the opportunity to save a company a lot of money in coating costs.

Coatings are becoming more important part of the flexographic process, and I have received more requests for “specialty” applications than ever before. We now have coatings that change the color or look of a label or package when heat or cold is applied. We have security coatings and specialty coatings for cell phone batteries. There are coatings for virtually every atmosphere that a printed product will or might be exposed to. UV, water, and solvent adhesives are applied in an array of thicknesses and weights.

Long story short, if you are not running a coating roll today, you most likely will be in the very near future.

Most coatings require a specific thickness or pounds per ream to achieve a desired functionality, and most coating manufacturers specify their own target ranges. The key is finding the minimum point at which the coating will perform to your customer’s requirements.

For example, if the target range is 1.0–1.25 lbs per 3,000 square feet, we would design a roll to achieve that range. Calculations based around the properties of the coating allow us to determine the approximate volume. We can then adjust the volume slightly higher and lower for a trial to determine the optimum coating weight for that particular application.

Suppose 1 pound per ream has been tested to be the minimum weight needed to maintain the coating’s properties. In the example below, the 4.5 band is too low and the 5.5 band is slightly high, so a 5 bcm roll would be a great choice. The cost savings is huge compared to the converter using a 1.25 lbs per ream target, which would require a 6.25 bcm roll. Although the 6.25 bcm anilox will work, why would we apply 20 percent more adhesive/coating than needed to make the product work? You probably don’t need me to tell you what to do with a 20 percent savings in adhesive usage.

This is a basic example of how you can utilize a banded roll to reduce coating waste while preserving coating integrity and performance. As always, it is the printer’s responsibility to monitor, measure and document coat parameters to ensure that a drop in cost weight does not cause a quality concern with your customers.

So there are multiple areas where a well thought out banded anilox strategy can be applied. They can be used to improve quality, to standardize different print processes and – most importantly – to identify cost savings and help maintain a competitive edge.

One last thought. Many printers recover these rolls after their trials. I suggest that you clean the roll and keep it in a safe place. It can be used again to test ‘new’ plates, inks, tapes, coatings, etc. that come onto the market, as well as acting as a quality control device to confirm that variables are consistent with earlier tests. When you feel, see or measure something that is different, put this roll back in with its original parameters, which were documented, and verify that all is still in order.