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Don't Get Caught by Bad Trapping

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Most buyers take the time to think through a major purchase or investment. In the printing environment, though, large plate investments are often made without much evaluation of how effectively colors will print over each other (color sequence) and whether the image is designed for optimal use of the ink. Nothing can complicate a printing job more! If your press crews scramble the print sequence or don't adjust the ink properly, the result is more set-up time and waste.

Educating your pre-press staff, plate and ink suppliers about trapping issues can reduce waste and press time. It also allows operators to focus on completing orders rather than discussing which plates should be hung in which station. This edition of *Paperwise* covers:

- The steps to take before a job is handed over to the plate supplier
- Trapping techniques to make your print jobs "flexo friendly"
- Testing methods to select the best trap for your equipment.

Print Trapping Defined

In the printing world, trapping has two definitions. Pre-press and plate suppliers define trapping as a way to modify neighboring colors to mask mis-registration on the press (Figure 1A). Most ink suppliers would say that trapping is the way one ink or color prints over another (Figure 1B). Both definitions are correct in that the purpose of a trap is to hide inherent mis-registration; and, if an ink does not print well over another, then its presence becomes obvious. In successful print jobs, both types of trapping must be well managed.

Good Trapping - Figure 1

All colors are trapped well and in register.

1. *Yellow and Cyan Trap*
2. *Cyan*
3. *Magenta and Cyan Trap*
4. *Magenta*
5. *Yellow and Magenta Trap*
6. *Yellow*

Poor Trapping - Figure 1A

Yellow is out of registration, causing a poor trap.

Poor Trapping - Figure 1B

Cyan and magenta do not trap well over yellow. The magenta does not trap well over cyan.

Why are Trapping Mistakes so Common?

Below are some common causes of trapping mistakes:

- End users, who supply the artwork to your pre-press departments, do not fully understand flexography.
- Plates are often inherited from competitors and you have to either run the plates or remake them. This is similar to wearing someone else's shoes – chances are, they will not be a perfect fit. Sometimes remaking the plates saves more money in the long run.
- The type of trapping that is best for the job is not evaluated. Not taking the time to investigate your options may seem easier and faster in the short-term, but it can lead to increased production time. Take the time!
- Pre-press staff or designers do not know that there are other options. Work with your plate, ink and substrate suppliers to gather all available information or ask for training. Suppliers are there to help.

Steps to Take Before Making Plates

Before making plates, it is important to consider your press, drying capabilities, and the types of ink formulation. Asking basic questions, as outlined below, will help determine the design of a job, the order in which to run it, and the ink formulation that allows for drying between traps.

Press: Knowing the number of stations and registration tolerances defines the range of options the designer can use to accommodate color sequence, color separation, and allowances for register in the design.

- What press will the job be run on?
- How many print stations are on the press and how many colors are in the job?
- How tightly can the press hold registration?

Drying Capabilities: It is important to consider drying times. Vacuum transfer significantly increases the airflow that goes through a press, making the ink dry more quickly. Interstation dryers allow more flexibility because the job design modifications are not necessary to compensate for slow ink drying. Also, anilox volume (bcm) is critical because the thicker the ink film, the longer it takes the ink to dry. Ask the following questions:

- Does the press have vacuum transfer?
- Does the press have dryers (interstation or tail)?
- What is the anilox lpi and bcm?

Inks: Work with your ink supplier to get an ink formulation for each job and the type of trap you are trying to achieve. Formulating inks correctly is a key element to a good trap. Wax or surfactants in water-based inks can cause poor traps, and if the pH or viscosity is incorrect for the press and substrate, one color may not trap over another.

- Are the inks specialty or standard GCMI colors?
- Does the ink contain surfactants or wax?
- Is the pH level and viscosity of the ink suitable for the press and the substrate I'm using?

Types of Trapping

The options to achieve similar results with different types of traps are discussed below. To make the explanations easier to understand, we have taken a two-color job (in one case three) and have trapped the colors in different ways. The job is to be printed on a white substrate.

No Trap: Without a doubt, a print job with no traps is the simplest way to run an order. There are no questions about which order to print or how one color is going to lay over another. The only concern is the registration.

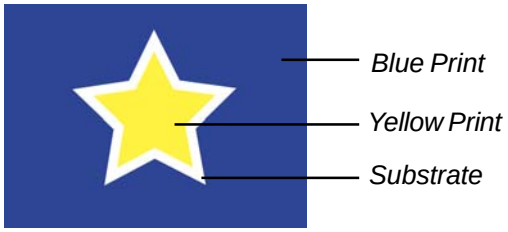

Figure 2

Holding Line Trap: This trap is designed when the two main colors do not need a trap built into the job and a line is used around the image or lettering to minimize any mis-registration issues. This type of trap involves using an extra color (typically dark and opaque, usually black) to hide any register problems that may occur on press. Designers often use this type of trapping to hide the trap that two colors may form when printed. The two main colors need to completely dry before printing the holding line over them.

Figure 3

Blue Print 1st Station | *Yellow Print 2nd Station* | *Black Print 3rd Station* | *Yellow and Blue Are Out of Register* | *Black Holding Line Hides Mis-registration*

Opaque Trap: This is probably the most common type of trapping in the corrugated industry. It involves printing your colors from light to dark and formulating the "trapping color" opaque. For example, in the picture below, the yellow is printed first and the opaque blue traps over the yellow. If the first down color is not dry when the darker color traps over it, pinholing can be very noticeable.

Figure 4

Yellow Print 1st Station | *Blue Print 2nd Station* | *Final Print*

Screened Trap: Screening a trapped area is a concept that many printers have taken advantage of in the past few years. This trapping technique should be used when printing the light color down first, screening the outside edges with a 60-80% screen and then using an opaque ink to print over it. Screens dry faster than a solid ink film, so this helps the issue of trapping a wet ink over another. Additionally, screening a trap can reduce the amount of pin-holing that occurs with an opaque trap.

Figure 5

Magenta Print 1st Station | *Blue Print 2nd Station* | *Final Print*

Transparent Trap: Over the past several years, transparent pigment and dispersion choices have become more readily available for the flexographic corrugated industry. Transparent inks can be used to give more gloss to the substrate, to make an extra color, and to have some pastel colors act as an overprint varnish. In the example below, an opaque blue is printed first, and then a transparent yellow is trapped over the blue. The combination of the colors produces green. This technique is effective for creating a third color when the number of print stations is limited.

Figure 6

Blue Print 1st Station | *Yellow Print 2nd Station* | *Final Print Yellow Traps Over Blue*

Depending on the color combination of the print job, it is possible to trap a transparent color completely over the first down color to provide the appearance of an overprint varnish. This technique particularly works well when trapping pastel or light colors over black. The example below shows how this technique can eliminate all trap lines while providing extra gloss.

Figure 7

Black Print 1st Station | *Yellow Print 2nd Station* | *Final Print Yellow Traps Over Black*

The best way to determine if this trapping technique is applicable to your job is by doing your homework first. Give your ink supplier the colors for the job and ask them to perform a "matched trap" or a "trap area match" of a color using the pastel transparent color over top. For instance, in the print job below, a red is made by trapping a solid yellow over magenta.

Figure 8

Magenta Print 1st Station | *Yellow Print 2nd Station* | *Final Print Yellow Traps Over Magenta*

Printing a lighter transparent color over the darker color usually provides the best-looking trap because pinholes are more apparent when trapping a dark color over a light color. In order to do this trap effectively, the darker color must completely dry before the lighter color traps over it. If the darker color is still wet, the plate of the lighter color may pick up the darker color ink and transfer it onto the anilox roll, which causes a dirty image, often referred to as ghosting.

Testing Methods to Determine Which Trap is Best

Running test plates is a good way to determine what a press is capable of printing. Work with your plate supplier to make a set of plates that have register targets and to determine how well your press holds register when running high and low speeds. Trapping solids over one another and over different line screen counts will also help prepare for upcoming jobs. Be sure to reverse the running order (trap dark to light and light to dark). *You will need transparent and opaque formulations of the darker color you are testing.* Some additional tips:

- Educate your customers and designers by giving them a tour of your facility and explain the limitations of direct print on corrugated board. Also, supply them with a specification sheet of press tolerances.
- Discuss the colors with your ink supplier to see if they have any suggestions on how to best design the job.
- Have a good understanding of the differences between opaque and transparent inks.
- Have pre-press and production staff review files and make changes before handing them over to your plate supplier.
- Put the run sequence on the plates to ensure that they are hung in the right station.

If you would like more information about trapping or other technical topics, please e-mail us at paperwise@smurfit.com or call us toll-free at 877-785-7835. You can also download and print copies of Paperwise from our Web site, www.ssccboardsales.com.